TRAVELLER®

HIGH GUARD
UPDATE 2022

SCIENCE FICTION ADVENTURE IN THE FAR FUTURE

TRAVELLER®

HIGH GUARD UPDATE 2022

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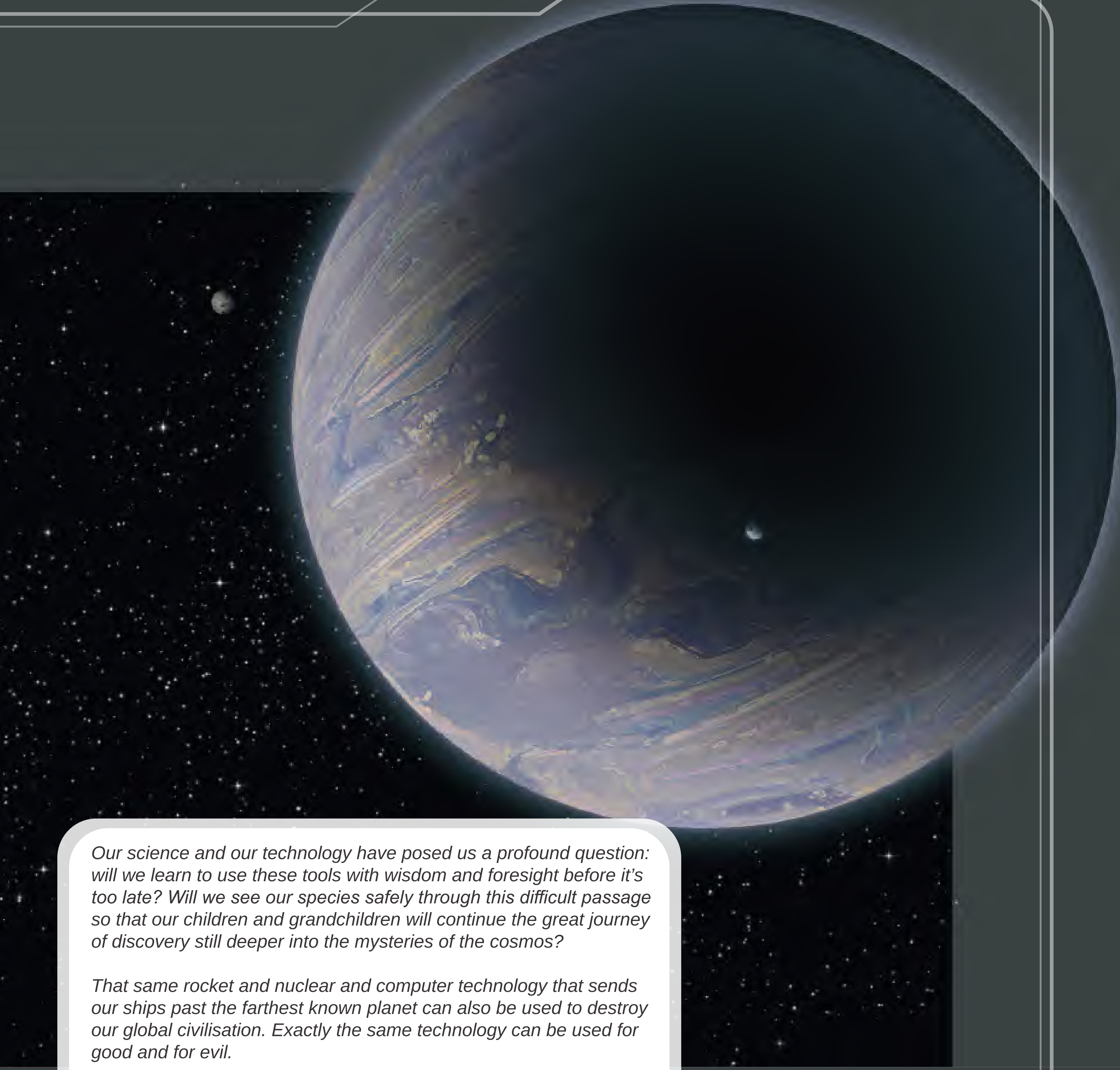


Our science and our technology have posed us a profound question: will we learn to use these tools with wisdom and foresight before it's too late? Will we see our species safely through this difficult passage so that our children and grandchildren will continue the great journey of discovery still deeper into the mysteries of the cosmos?

That same rocket and nuclear and computer technology that sends our ships past the farthest known planet can also be used to destroy our global civilisation. Exactly the same technology can be used for good and for evil.

It is as if there were a god who said to us: 'I set before you two ways. You can use your technology to destroy yourselves, or to carry you to the planets and the stars. It's up to you.'

- Carl Sagan

INTRODUCTION

HIGH GUARD

Refuelling operations for a task force are dangerous, as forces that are low on fuel and manoeuvring in a gravity well are especially vulnerable. The High Guard position, so named because the ship or ships involved are higher in the gravity well than their companions, is used to mount protective operations during such manoeuvres.

Welcome to *High Guard Update 2022*.

This book is a major expansion for *Traveller*, enabling you to design, build and fly spacecraft of all types found throughout the galaxy. You will find rules to modify existing ships, design high-performance space superiority flyers and build gargantuan capital ships to travel the space lanes.

High Guard also presents new approaches to handle spacecraft operations, from engaging in vicious boarding actions to spacecraft security, from employing a range of warheads in missiles to accessing technologies seen in science fiction settings beyond Charted Space. Your warp drives await.

With more options and more powerful weapons, *High Guard* returns to space combat and provides a rules framework to use in epic space battles, from spiralling dogfights involving a handful of lightweight fighters to the clash of heavily armed battleships across a front stretching through an entire star system.

THE IMPERIAL NAVY

An interstellar community operates under many restrictions, most notably the fact that it consists of many planets that are like islands in an ocean of vacuum. Such a society must have control of that ocean. In the Third Imperium, the force that rules the space between the stars protects both commercial transportation and communication vessels and, as a result, controls all intercourse between worlds. The instrument of this control is the Imperial Navy.

The seat of government for the Third Imperium is at Capital, an industrial and technological powerhouse, but due to the sheer distances and travel times involved within its star-spanning realm, the Imperial Navy is unable to be everywhere at once. As a result, the Imperium grants a large degree of autonomy to its subject worlds, demanding only that they abide by Imperial law and contribute to a united front against outside forces.

Local provinces (subsectors) also maintain their own navies, as do individual worlds that have the means to do so, all subject to the authority of the Emperor and the Imperial Navy. This three-tiered structure of Imperial, subsector and planetary navies produces a flexible system for patrolling space, while putting the limited resources of the Imperium to best use. High Guard deals with the navies of the Imperium, of subsectors and of worlds.

THE SHIP'S LOCKER

Every ship has a ship's locker, usually located near an airlock, cargo bay or the bridge, for the convenience of the crew. Typical equipment within includes protective clothing, vacc suits, weapons such as shotguns, pistols and cutlasses, ammunition, compasses and survival aids, and portable shelters. The contents of the locker are defined by the Referee only when needed but they always contain vacc suits and other useful items. The ship's locker is usually protected by a biometric lock keyed to the ship's officers.

Abusing The Ship's Locker

The purpose of the ship's locker is to provide useful mundane equipment on demand so Travellers do not have to keep track of every single flak jacket and toolkit. It is not an inexhaustible supply of free stuff, nor is it a magic box that produces whatever the Travellers happen to need at any given moment. Referees should sternly refuse any unreasonable requests regarding the contents of the ship's locker – it is a tool to simplify bookkeeping, nothing more.

The sheer size of the Imperium precludes the navy from concentrating its forces in one place – if war broke out on one border of the Imperium, it would be months before news reached the capital, and long months more before the navy could respond. Instead, there are one or more Imperial fleets for each sector, named for that sector.

The Imperial Navy is a tool for diplomacy and conquest as needs dictate; the Emperor’s own sabre. The Imperial Navy has some of the largest and most powerful vessels in space – dreadnoughts, battle tenders and other mighty warships.

SUBSECTOR NAVIES

Each subsector maintains its own fleet of ships, composed normally of cruisers, escorts, frigates and smaller auxiliary ships. Subsector navies are primarily responsible for defence, patrol of the spaceways and safeguarding trade and commerce within their subsectors. In wartime, each subsector is required to put a fraction of its ships at the disposal of the Imperial Navy to act as reserves and reinforcements.

PLANETARY NAVIES

Planetary navies are responsible solely for the defence of their home system or a handful of related systems held by the same noble, usually a duke or count. At minimum, a planetary navy protects the space up to the main world’s jump limit but, in most systems, it has bases in orbit of the main world and the gas giant, as well as a presence at any inhabited worlds or asteroid belts. Planetary navies tend to be eccentric at best – officers are often retired or cashiered command staff from the subsector navy, poorly educated locals using out-of-date tactics and third or fourth sons of noblemen. The equipment is equally eclectic – a combination of local designs, antiques and monitors.

IMPERIAL NAVAL OPERATIONS

Naval vessels generally operate in task forces or squadrons, rather than alone; the merits of each individual ship supplement and complement the others in company with it. Squadrons are given a numerical designation when they are created, which are tacked onto the squadron type to give their full squadron name. A BatRon given the designation 175 would be known as BatRon 175 or the 175th BatRon. The squadrons are also prefixed with a classification dependant on what part of the fleet they serve with. A front-line regular fleet unit would have the classification ‘Imperial’ prefixed; a planetary squadron is usually referred to as a colonial squadron and prefixed ‘Colonial’. Reserve squadrons are considered to be part of the regular fleets and keep the Imperial classification.

Battle Squadrons (BatRons) are built around dreadnoughts and battleships, and are designed to smash through enemy lines and engage other Battle Squadrons. Auxiliary craft attached to a BatRon are limited to a few fuel tankers and fast-moving tenders and couriers, and must stay out of the line of fire when dreadnoughts clash.

Cruiser Squadrons (CruRons) have a core of cruisers accompanied by escorts and frigates. These are the workhorses of the Navy, given assignments such as holding captured systems, interdicting or bombarding enemy worlds, supporting the Battle Squadron advance or harassing enemy supply lines.

Assault Squadrons (AssaultRons) have the duty of capturing enemy worlds and are made up of ortillery ships and troop transports. Often, a naval force can take control of space but face significant resistance on the ground and the only way to hold a world is to occupy it with soldiers.

SYSTEM DEFENCE BOATS AND MONITORS

A considerable percentage of any starship is taken up with jump engines and fuel tanks. This means that a non-jump-capable ship can defeat a starship of equal or even considerably greater tonnage. System Defence Boats are 200- to 500-ton patrol boats used for planetary defence. Monitors are the same concept on a capital scale – a monitor is a multi-thousand-ton warship with the bulk of its tonnage allocated to weapons and manoeuvre drives. Many monitors are constructed from planetoids, or by stripping the jump engines and fuel tanks from an outdated warship hull. It is very rare for a brand-new monitor to be built using modern technologies, although especially important worlds can justify such protection. Sector capitals are sometimes protected by such ‘supermonitors’.

Carrier Squadrons (CarRons) are made up of tenders or carriers – single large ships that carry well-armed smaller ships that actually do the fighting when battles are joined. Fighter carriers transport large numbers of high-performance small craft in the 10- to 50-ton range. Battle tenders are often 100,000 tons and up, and transport several jump-incapable battle riders that may themselves be 10,000 tons or more.

The points of greatest danger to carried squadrons are immediately prior to jump (when the craft or ships have been recalled) and just after returning to normal space (when the craft have not yet been launched).

Tanker Squadrons (TankRons) are mostly composed of huge fuel tankers, which carry the millions of tons of hydrogen fuel needed by a jump-capable fleet. As such vessels are very vulnerable, a TankRon is normally led by a cruiser and accompanied by numerous armed escorts.

Scout Squadrons (ScoutRons) are rarely maintained fulltime by the navy but are assembled as needed. ScoutRons are made up mainly of ships borrowed from the Imperial Interstellar Scout Service, together with a handful of larger fast frigates and stealth ships.

DEFINITIONS

A number of definitions and conventions are used throughout *High Guard*, drawn from Charted Space, other science fiction settings and navies of our own modern world. The terminology used throughout this book is consistent and noted here for easy reference. Note that specific universes might have their own interpretations of some of these definitions.

GENERAL

Ships are measured in ‘displacement tons’ or d-tons: a 100-ton ship displaces a volume equal to one 100 tons of liquid hydrogen (one d-ton equals roughly 14 cubic metres).

Ship: A spacecraft of 100 tons or more.

Small Craft: A spacecraft of less than 100 tons. Small craft are incapable of jumping to other star systems.

Capital Ship: A military ship of more than 5,000 tons.

System Ship: A ship without jump drives.

Starship: A ship of 100 tons or more that is capable of jump travel.

SMALL CRAFT

Boat: A small long-range interplanetary craft, designed for independent operations.

Shuttle: A large cargo or passenger carrier, used to travel from orbit to surface and back again.

Fighter: A small, short-ranged fast combat vessel, normally displacing 50 tons or less.

Bomber: A heavier combat vessel, usually equipped with weapons capable of damaging a capital ship or ground-based structures.

Torpedo Boat: A special variety of bomber equipped with torpedoes.

STARSHIPS

Blockade Runner: A ship designed to be fast enough and tough enough to force its way through a formation of enemy ships.

Courier: A small ship dedicated to speed (either in real space or through large jump distances), allowing it to carry valuable cargo or personnel quickly.

Q-Ship: A trader, merchant, freighter or other civilian vessel that has hidden weapons, used to trap pirates and other raiders.

Trader/Merchant: A small (sub-1,000 ton) ship dedicated to carrying cargo and passengers.

Freighter: A large (1,000 tons or more) ship dedicated to carrying cargo.

Liner: A ship dedicated to carrying passengers long distances in comfort.

Yacht: A pleasure ship, capable of taking a small number of passengers across space in great comfort.

MILITARY SHIPS

Cutter: An armed ship that is both small and cheap. Cutters are often found in system-defence, antipiracy or customs roles in the hands of law enforcement or planetary navies.

Corvette: A larger version of the cutter, sometimes also capable of making light and fast raids.

Frigate: A small but powerful warship, the role of a frigate is to roam space away from a fleet, patrolling borders and attacking commerce. Known as Destroyer Escorts in Imperial Navy parlance.

Destroyer: Similar to frigates, a destroyer's main role is to serve as picket defence for a fleet, eliminating small ships and fighters before they can threaten larger ships.

System Defence Boat: Foregoing a jump drive, a system-defence boat is capable of mounting more armour and weapons than the equivalent starship, making it perfect for the defence of a single star system. The largest are called monitors.

Fleet Escort: Similar in function to Destroyers, but larger and more capable.

Troop Ship: A flying barracks, these ships are designed to ferry platoons, companies or entire regiments between planets.

CAPITAL SHIPS

Cruiser: The mainstay of a fleet, the cruiser is a large capital ship capable of outgunning anything it cannot outrun and outrunning anything it cannot outgun.

Light Cruiser: Either a small and fast cruiser, or one with smaller and cheaper weaponry, intended to fulfil the cruiser role while keeping to a budget.

Heavy Cruiser: A cruiser with notably increased weaponry, either in number of guns or their size.

Armoured Cruiser: Where a heavy cruiser has increased firepower, the armoured cruiser has increased armour and is capable of standing in the frontline of battle.

Strike Cruiser: A cruiser designed to operate on its own or in small squadrons, strike cruisers have a combination of range, firepower and durability. They act on their own or at the vanguard of an attack.

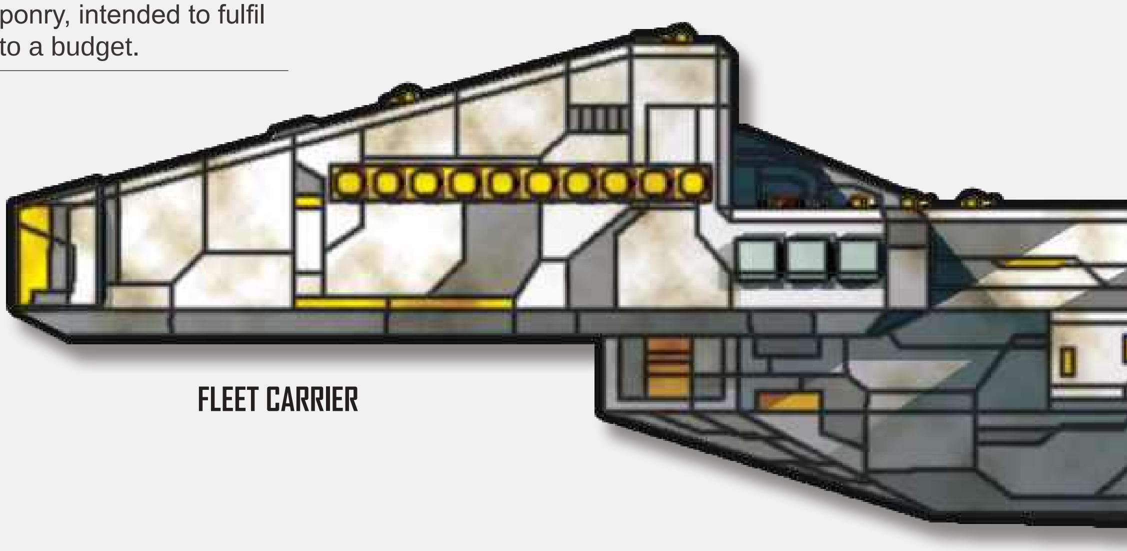
Carrier: A general term used for any starship that carries and deploys numerous small craft, usually fighters and their equivalents. A light carrier is the equivalent of a cruiser, while a heavy carrier is equivalent to a battleship.

Escort Carrier: The escort carrier is designed to protect small fleets, be they military or civilian, and is equivalent to a destroyer. Its main weaponry is carried by the small craft it transports, rather than the carrier itself.

Assault Carrier: A well-armed and armoured carrier used to transport large numbers of troops for planetary assaults.

Fleet Carrier: A very large carrier, often the flagship of the fleet it travels with.

Battle Tender: A vast carrier that takes battle riders into battle rather than small craft, allowing them to engage targets that require jump travel to reach.



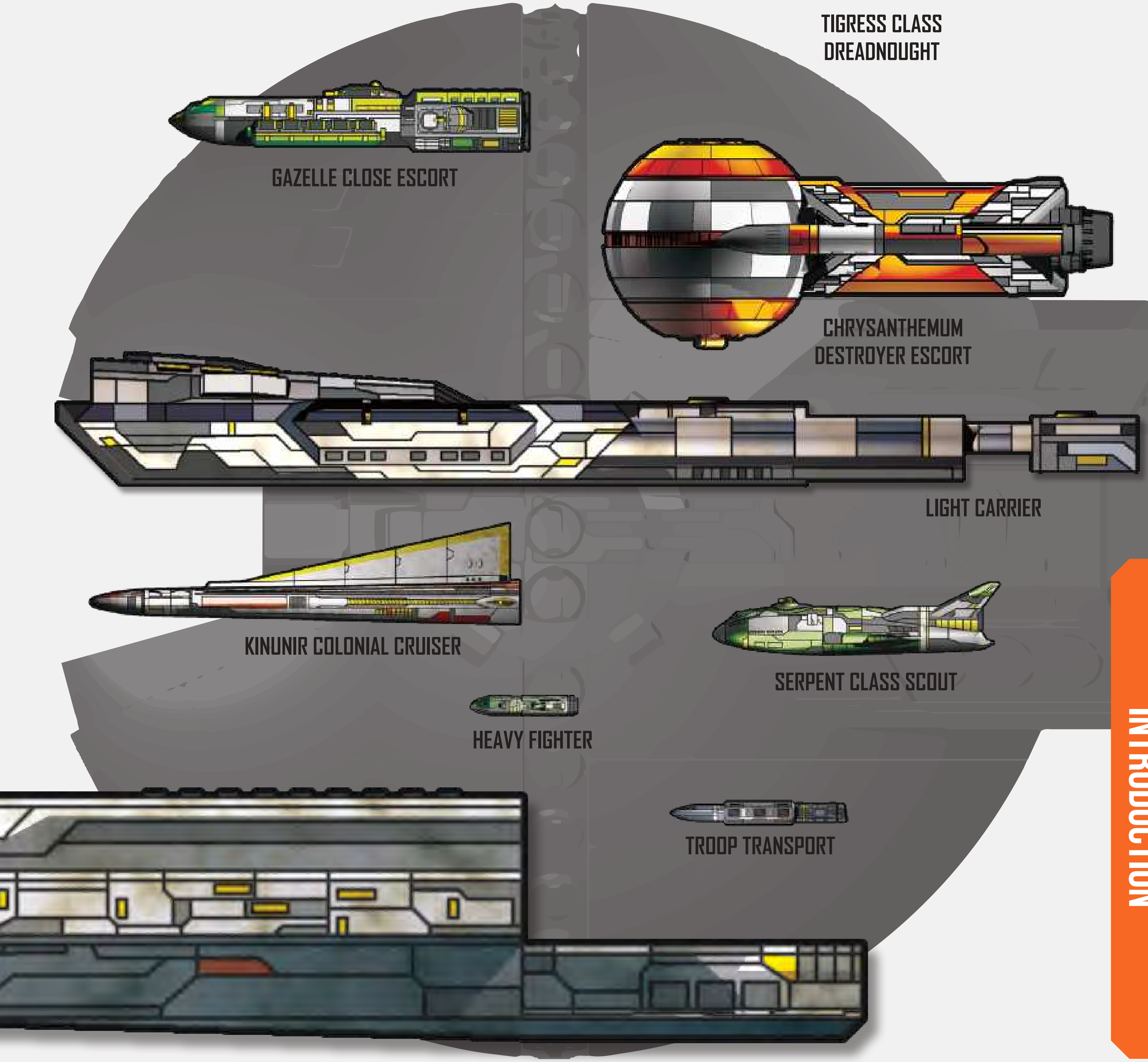
FLEET CARRIER

Battle Rider: A large ship, typically destroyer or even cruiser size, that has no jump engines. They are intended to be taken into battle in other systems by a battle tender.

Battleship: A very large capital ship with thick armour and powerful weapons. Sometimes called ships-of-the-line, battleships are the strength of a fleet and are designed to destroy any enemy they meet.

Battlecruiser: A battlecruiser is similar in size and role to a battleship but either foregoes armour for increased speed or speed for increased firepower.

Dreadnought: The largest fighting ships of a fleet, dreadnoughts are over-sized battleships, fulfilling the same role but with notably more firepower and greater durability.


TIGRESS CLASS
DREADNOUGHT
GAZELLE CLOSE ESCORT
CHRYSANTHEMUM
DESTROYER ESCORT
LIGHT CARRIER
KINUNIR COLONIAL CRUISER
SERPENT CLASS SCOUT
HEAVY FIGHTER
TROOP TRANSPORT

SHIP DESIGN

The ship construction system detailed in this chapter is your gateway to creating your own ship designs or modifying existing ones, limited only by your imagination and the laws of physics in the far future.

Spacecraft are large and complicated vehicles, capable of crossing vast regions of space and unleashing weapons of terrifying power. The ship design rules presented here allow you to specify each component within a spacecraft but make sure to go through the design process step-by-step. If you get lost or confused, simply return to the checklist on page 9 to see where to go next.

Throughout the design process, keep track of two key numbers – the total tonnage of the ship (and how much the components you have added have consumed) and the total cost. The mathematics required to create a ship are not complex but you may find it handy to have a calculator close by.

STANDARD DESIGNS VS. NEW DESIGNS

Some ship designs have been used for centuries and have become standard across the stars. Plans for such spacecraft are freely available and components can be purchased in bulk by shipyards, reducing the cost of the ship's construction by 10%. This reduced cost does not include ammunition for weapons or fuel, which must be bought at full price.

If a buyer needs a new type of ship, a starship architect must be employed to design it. The architect's fees are an additional 1% of the final cost of the ship.

CONSTRUCTION TIMES

Construction times vary widely, depending on the size and complexity of the spacecraft and the capabilities of the shipyard.

On average, assume that it takes one day per million Credits to build a spacecraft at an average commercial shipyard. At the Referee's discretion, very large ships can be built in a modular fashion allowing simultaneous construction. This means the total construction time can be reduced by up to 90%. This is typically done only on ships exceeding 50,000 tons.

High-tech shipyards have superior automation and faster-working processes, reducing construction and customisation times. See the Construction Time Reduction table for the multiple for each Tech Level.

Construction Time Reduction

Tech Level	Construction Time
12	90%
13	80%
14	70%
15	60%
16	50%

COSTS

Spacecraft are extremely expensive and once options start being added, their cost can easily eclipse the simple designs found in the *Traveller Core Rulebook*. The construction of new spacecraft can be funded using finance options, as detailed starting on page 149 of the *Traveller Core Rulebook*.

TECH LEVEL

Before you start building your ship, decide on the Tech Level of the shipyard that will construct it. This is the maximum Tech Level available for any given component you add and also serves as the overall Tech Level of the ship itself.

SHIP DESIGN CHECKLIST

1. **CREATE A HULL**

a. Choose Hull Configuration (page 10).
b. Install Armour (page 12).
c. Install Hull Options (page 13).

2. **INSTALL DRIVES**

Page 15

3. **INSTALL POWER PLANT**

Page 17

Providing enough power for drives, weapons, sensors and optional systems.

4. **INSTALL FUEL TANKS**

Page 18

5. **INSTALL BRIDGE**

Page 19

6. **INSTALL COMPUTER**

Page 20

7. **INSTALL SENSORS**

Page 21

8. **INSTALL WEAPONS**

Page 21

If desired

9. **INSTALL OPTIONAL SYSTEMS**

Such as smaller craft and fuel purification plants.

Page 21

10. **DETERMINE CREW**

Page 22

11. **INSTALL STATEROOMS**

Page 24

Including low berths, briefing rooms and armouries.

12. **ALLOCATE CARGO SPACE**

Page 25

13. **FINALISE DESIGN**

Page 25

STEP 1: CREATE A HULL

The first step in designing a ship is to build its hull. This is the body of the ship, its fuselage.

Decide on the total tonnage of the ship. The size of the hull affects the performance of the ship and, ultimately, limits what it can carry and achieve. A hull must be a minimum of five tons and jump-capable ships must be at least 100 tons. For ease of calculation, use round numbers; for example, 400 tons, not 425.

Most of the ships that Travellers use are in the 100- to 2,400-ton range. These ships are sometimes called 'adventure-class ships' because they are the sort usually featured in *Traveller* adventures. Ships in the lower end of this range might even be affordable by a group of Travellers who want to purchase their own ship. Ships above 1,000 tons are usually seen in the backdrop of a campaign, including everything from a 3,000-ton destroyer escort on patrol, to a 40,000 megafreighter making a freight delivery, to an enormous warship of 500,000 tons defending a star system. Naval campaigns might have a group of Travellers serving aboard a ship of 50,000 tons or more. For a typical *Traveller* campaign, most ships will be 1,000 tons or less.

A basic hull costs Cr50000 per ton. The ship has 1 Hull point for every full 2.5 tons of hull. This figure is used to determine how durable the ship is when damaged.

MASSIVE SHIPS

Very large ships require a lot more internal bracing to support their mass under acceleration but this has the effect of increasing their durability under fire. Ships of 25,000–99,999 tons have 1 Hull point for every 2 tons of hull. Ships of 100,000 tons or more have 1 Hull point for every 1.5 tons of hull.

HULL CONFIGURATION

The configuration of a hull dictates its shape which, in turn, affects the capability of the ship. Some ships may be capable of entering atmospheres, for example, while others will be destroyed if they try.

The hull configuration chosen for a ship affects its cost as more complex engineering factors must be resolved before it can be built, as shown on the Hull Configuration table. Once chosen, the hull configuration cannot be changed – it is not possible to retrofit a new hull configuration.

Streamlined hulls are designed to enter planetary atmospheres and function in a similar fashion to conventional aircraft. Partially streamlined and unstreamlined hulls incur penalties when flying in atmosphere (see Atmospheric Operations, *Traveller Core Rulebook* page 152).

Starting at TL9, all hulls are self-sealing. A self-sealing hull automatically repairs minor breaches, such as micrometeoroid impacts, and prevents hull hits from causing explosive decompression.

Apply any hull cost and Hull point modifiers for the selected configuration, using the Hull Configuration table.

Planetoid and Buffered Planetoid Hulls: These require an asteroid to be dragged from its orbit and hollowed out to be used as the exterior hull of a spacecraft. This costs Cr4000 per ton but only 80% of the volume of a planetoid is useable as a spacecraft. For a buffered planetoid, 65% of the volume is useable.

However, a planetoid's Hull points are calculated on the total volume of the planetoid, not the useable space. Note that planetoid hulls cannot use the specialised or additional hull types, listed in the following sections:

HULL CONFIGURATION EXAMPLES

Standard: Boxy, cylindrical, series of joined boxes, possibly with rounded edges. Examples: yacht, subsidised liner.

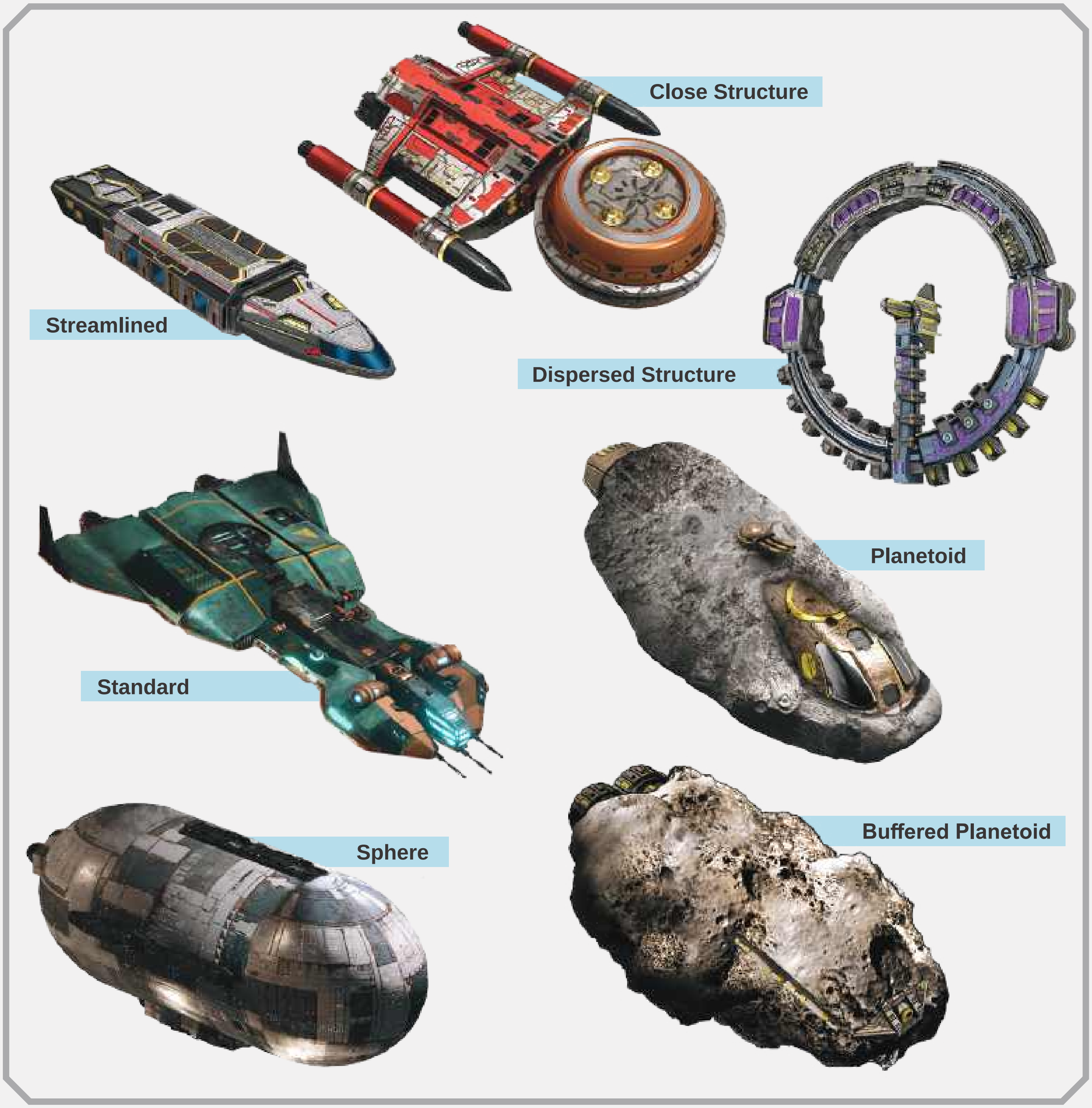
Streamlined: Needle, wedge, disc, lifting body, lozenge, boxy with rounded nose. Examples: pinnace, shuttle, scout/courier, free trader.

Sphere: Sphere or large spheroid with limited protuberances. Examples: express boat, mercenary cruiser.

Close Structure: Boxes joined by sturdy struts or with multiple projecting elements. Examples: *Chrysanthemum-class* destroyer escort, *Gazelle-class* close escort.

Dispersed Structure: Irregular joined shapes, open framework, rings. Examples: *Donosev*-class survey scout, Lab Ship, *Arakoine*-class strike cruiser.

Planetoid/Buffered Planetoid: Generally lumpy, rounded potato shapes. Example: Planetoid Monitor.


Close Structure
Streamlined
Dispersed Structure
Planetoid
Standard
Buffered Planetoid
Sphere

Hull Configuration

Hull Configuration	Streamlined?	Armour Volume Modifier	Hull Points	Hull Cost
Standard	Partial	—	—	—
Streamlined	Yes	+20%	—	+20%
Sphere	Partial	-10%	—	+10%
Close Structure	Partial	+50%	—	-20%
Dispersed Structure	No	+100%	-10%	-50%
Planetoid	No	—	+25%	Special
Buffered Planetoid	No	—	+50%	Special

SPECIALISED HULL TYPES

Not all spacecraft hulls are built the same way and it is possible for naval architects to use advanced construction techniques to make a hull more resilient or, alternatively, cut costs by using lower-grade materials and shortcuts during manufacture.

Reinforced Hull: By increasing the cost of a hull by +50%, a ship can have its Hull points increased by +10%.

Light Hull: By decreasing the cost of a hull by -25%, a ship can have its Hull points decreased by -10%.

Military Hull: By increasing the cost of a hull by +25%, a ship may install armour up to double its standard rating. For example, a non-military hull made of bonded superdense has a maximum armour value equal to the Tech Level of the ship, as described in the Hull Armour table on page 13. However, a ship with a military hull may add up to double that value in armour. Military hulls can only be applied to capital ships (greater than 5,000 tons) and can stack with the reinforced hull option.

Non-Gravity Hull: Basic hulls include artificial gravity, using grav plates to ensure a normal gravitational environment for the comfort and convenience of the crew. Hulls can be built cheaper without artificial grav plating, using specific configurations that allow the hull to constantly spin in order to generate gravity if desired. Non-gravity hulls reduce hull cost by 50% but are limited to a maximum size of 500,000 tons due to structural limitations. Base Power Requirements for non-gravity hulls are half that of other hull types. See Power Requirements on page 17 for more information.

ADDITIONAL HULL TYPES

Within the standard configurations, there are a variety of further options that allow the design of more complex ships.

Double Hull: This is a two-hulled cylinder where the outer hull (the whole, or at least a part) spins to create gravity and the inner hull does not. The outer hull is kept at around 1G by the speed of its spinning and is used for any areas that will be inhabited for extended periods of time, such as crew quarters. The outer, spun hull must be at least 60 tons. Machinery to spin a double hull uses 0.1 ton for every ton of outer hull. For each full percent of the total hull that is made part of the spun hull, the cost of the hull must be increased by +1%.

Hamster Cage: This is a series of rings, spun to emulate gravity. The rings must have a radius of at least 15 metres in order to simulate a gravitational field. Machinery to spin a hamster cage uses 0.1 tons for every ton of spun ring. Unlike other designs, the hamster cage is usually set at right angles to the hull and installed in counter-rotating pairs, eliminating torque effects on the ship's attitude. For each full percent of the hull that is made part of the hamster cage, the cost of the hull is increased by +2%.

Breakaway Hulls: A ship can be designed so it can operate as two or more independent vessels, breaking or splitting away from one another. Each section must have an appropriate bridge and power plant to operate it. Manoeuvre drive, jump drive, sensors, weapons, screens and so forth are all options that can (and, under normal circumstances, should) be included in each section. While the sections are together, drives, power plants and weapons can all be combined when calculating performance. This whole process consumes 2% of the combined hull tonnage for the extra bulkheads and connections needed, and costs MCr2 per ton consumed. Hull points of each section will be proportionate to the total Hull points of the ship.

For example, you have a 1,000 ton ship and decide to split it so 400 tons can break away as a separate vessel. You install 20 tons of manoeuvre drive in the 400 ton section, which gives it Thrust 5, while the 600 ton section has 66 tons of manoeuvre drive giving it Thrust 9. When combined, this is 86 tons of manoeuvre drive giving the 1,000 ton vessel Thrust 8. It typically takes 1D rounds to separate a breakaway hull.

INSTALL ARMOUR

All hulls provide some protection from weapons but it is possible to add heavier armour for better defence. All hulls start with armour Protection +0, although this can be improved upon. Planetoid hulls provide a ship with armour Protection +2 (Protection +4 if they are Buffered Planetoids).

The Hull Armour table shows how much of the hull's tonnage is consumed per point of Protection added, along with its costs. A minimum TL is required for each type of armour and there is a maximum amount that can be attached to a hull – this includes any armour the ship had prior to modification.

Apply the Armour Volume Modifier from the Hull Configuration table to the base armour tonnage.

Hull Armour

Armour	TL	Tonnage Consumed	Cost Per Ton	Maximum Protection
Titanium Steel	7	2.5%	Cr50000	TL or 9 (whichever is less)
Crystaliron	10	1.25%	Cr200000	TL or 13 (whichever is less)
Bonded Superdense	14	0.80%	Cr500000	TL
Molecular Bonded	16	0.50%	MCr1.5	TL+4

EXAMPLE: MAKING A HULL

Assembling a hull can become complicated. First select the hull size and calculate its base cost. Then recalculate the cost using the configuration multiplier. If one of the specialised or additional hulls are selected, recalculate the cost again, using the modified hull cost and multiplying it by the the hull multiplier for the specialised or additional hull type. Following is an example:

1. *The designer decides to build a light cruiser. A hull size of 2,000 tons is selected. The cost of the hull is 2,000 x Cr50000, which comes to MCr100.*
2. *Despite its fairly large size, the ship is intended to make atmospheric landings, so the designer selects a streamlined configuration, which makes the hull 20% more expensive. Multiply the hull cost by 1.2, raising its price to MCr120.*
3. *The ship is specialised for military use but is not large enough to use the Military Hull option, so the designer selects the Reinforced Hull option to make it more sturdy. This adds 50% to the hull price with the configuration price increase already added in. Multiply the hull cost with configuration increase added in by 1.5, raising its price to MCr180. Note that if the ship were larger than 5,000 tons and the designer wanted to add the Military Hull option as well, they would add the two price increases (reinforced and military) together before calculating the final cost of the hull.*

ARMOUR TONNAGE AND COST

Adding armour of any type requires a framework upon which armour is attached. This framework is more difficult to apply to small hulls and therefore requires a greater portion of the tonnage on smaller spacecraft.

After determining basic hull armour Protection (modified by the hull configuration, if necessary), multiply the tonnage by the multiplier in the Armour Tonnage table. Apply this multiplier *after* the Armour Volume Multiplier from the Hull Configuration.

For example, when designing a 10-ton light fighter with crystaliron armour, the Tonnaged Consumed of 1.25% is multiplied by the Armour Tonnage multiplier of 4. So, the tonnage consumed for the fighter becomes 5%.

Armour Tonnage

Hull Size (Tons)	Armour Tonnage Multiplier
5–15	x4
16–25	x3
26–99	x2
100+	x1

Molecular Bonded: This armour is so dense that not even tachyons can pass through unimpeded. Tachyon weapons attacking a ship with molecular bonded armour lose their AP trait.

Breakaway Hulls: Armour can be allocated on a per-section basis if a breakaway hull is used, in which case the tonnage and cost are determined as if the two differently armoured sections of the ship were different vessels.

INSTALL HULL OPTIONS

Hulls can be further modified with a range of options to create specialised ships. Each option can only be added once.

HEAT SHIELDING (TL6)

Heat shielding protects the ship against the heat of re-entry or close proximity to a star. A ship without a functioning gravitic drive that attempts re-entry without heat shielding will burn up. If equipped with undamaged heat shielding, re-entry is successful on an Easy (4+) Pilot (1D x 10 minutes, DEX) check, with failure resulting in burn-up (this task is often undertaken at a slower rate, making it easier). Damage to the ship from proximity to a star in the absence of heat shielding is at the Referee's discretion but should start at 1D per round, increasing by a cumulative 1D as the ship gets closer. Heat shielding does not provide protection against starship weapons. Heat shielding costs MCr0.1 per ton of hull.

RADIATION SHIELDING (TL7)

Radiation shielding improves the crew's protection against radiation from both natural sources (such as solar flares and pulsars) and artificial (including nuclear missiles and meson weapons). A ship with radiation shielding decreases the amount of rads absorbed by all crew by 1,000 (rather than the normal 500) and treats the bridge as if it is Hardened. Radiation shielding costs Cr25000 per ton of hull.

REFLEC (TL10)

Reflec coating on a hull increases the ship's Protection against lasers by +3 but cannot be combined with Stealth. Adding Reflec costs MCr0.1 per ton of hull.

SOLAR COATING

Solar power can be used to provide a ship's basic power needs and – in concert with high-efficiency battery technology – to provide a high degree of flexibility for power usage by specific components. Solar power also serves as a reliable backup power solution in the event that a ship has its power degraded due to damage suffered during space combat or other mishaps. Solar coatings cannot be combined with any of the other listed hull options except radiation shielding. Solar coating and extendible solar panels are described in Solar Energy Systems on page 44.

STEALTH

Stealth absorbs radar and lidar beams, and disguises heat emissions, applying a negative DM to Electronics (sensors) checks made to detect or lock onto the ship (see the Stealth Types table). Apply an additional DM-1 for every Tech Level the ship is higher than the sensors trying to locate it. At TL8, Stealth consists of an emissions absorption grid on the hull that nullifies electronic emissions. At TL10+, Stealth is achieved by applying a coating to the exterior of the ship and no additional tonnage is required. See the table below for the Tech Levels, cost per ton of hull, the DM applied to Electronics (sensors) checks when trying to detect the ship and tonnage required. Stealth cannot be combined with Reflec.

RADIATION DAMAGE ON LARGE SHIPS

Some ship weapons are capable of dealing radiation damage to the crew of a target via the Radiation trait (see page 31 of the *Traveller Core Rulebook*). This is simple to apply to low-tonnage ships but more complex when assessing damage to cruisers and battleships that mass in thousands of tons with hundreds or even thousands of crew members.

To keep things simple, without glossing over the effects of accumulating radiation damage on the crew of large vessels, simply apply a cumulative DM-1 to all actions a ship performs for every 10% of Hull it loses to Radiation weapons. If the ship has radiation shielding, increase this to DM-1 every time it loses 40% of its Hull to Radiation weapons.

If meson weapons are used, ignore radiation shielding – regardless of the protection the ship has, the crew will still be getting a full dose of radiation from these weapons.

Stealth Types

Type	TL	Cost Per Ton of Hull	Electronics (sensors) DM	Tonnage
Basic	8	MCr0.04	DM-2	2% of hull
Improved	10	MCr0.1	DM-2	—
Enhanced	12	MCr0.5	DM-4	—
Advanced	14	MCr1.0	DM-6	—

STEP 2: INSTALL DRIVES

Once you have your basic hull complete, it is time to start filling it. The first items to add are the engines so the ship is able to move through space. These include manoeuvre and jump drives. Manoeuvre drives use gravitic technology to push the ship through space – it is these that give a ship its Thrust score.

HOW MANOEUVRE DRIVES WORK

The primary component of manoeuvre drives in the Charted Space universe is the thruster plate. Thruster plates use gravitic technology to move a ship without the need for exhaust propellant. When in operation, thruster plates build up an ionisation field that glows blue. The higher the thrust employed, the brighter and more vibrant the blue colour appears.

Another important feature of all manoeuvre-drive systems is gravitic compensators or 'G compensators'. These enable a ship to engage in high levels of thrust without adversely affecting the crew contained inside. Ships are typically equipped with enough gravitic compensation to counter whatever Thrust score the ship has. Therefore, a ship with Thrust 4 is also equipped to compensate for 4 Gs of thrust.

Jump drives allow a ship to travel faster-than-light across interstellar distances. Jump drives create a bubble of hyperspace by means of injecting high-energy exotic particles into an artificial singularity. The singularity is driven out of our universe, creating a tiny parallel universe that is then blown up like a balloon by injecting hydrogen into it. The jump bubble is folded around the ship, carrying it into a ship-sized pocket universe that collapses after about one week, bringing the ship back into normal space several light-years from its original position.

Reaction drives are similar to manoeuvre drives but instead act as giant thrusters, exhausting gases that push the ship forward like today's rockets.

To fit a manoeuvre or reaction drive, consult the Thrust Potential table and decide what Thrust score you want your ship to have. The figure below that Thrust score shows what percentage of the ship's hull the manoeuvre drive consumes, in tons.

SYNCHRONISED JUMPS

When on the offensive, it is advantageous for every ship in a fleet to arrive at their destination within a few minutes of one another instead of appearing in dribs and drabs over the course of several hours and allowing an alert enemy to engage the ships of the fleet piecemeal.

Ships within a fleet can synchronise their jumps so they arrive at their destination within the same combat round but this takes some engineering skill and a lot of processing power.

To synchronise a jump, every ship taking part must have a crew member succeed at a Difficult (10+) Engineer (J-drive) check (1D rounds, INT or EDU).

If one ship fails in this check, then it may not join in the synchronised jump. If this happens, the admiral may choose to jump without it or give the order for every ship to make the check again, restarting the whole process. Synchronised jumps use the same Jump Control software as normal jumps but the software requires an extra +5 Bandwidth on top of its usual demands.

Thrust Potential

Manoeuvre Drive Rating	0	1	2	3	4	5	6	7	8
% of Hull	0.5%	1%	2%	3%	4%	5%	6%	7%	8%
Manoeuvre TL	9	9	10	10	11	11	12	13	14
Reaction Drive Rating	0	1	2	3	4	5	6	7	8
% of Hull	1%	2%	4%	6%	8%	10%	12%	14%	16%
Reaction TL	7	7	7	7	8	8	8	9	9

Manoeuvre Drive Rating	9	10	11	12	13	14	15	16
% of Hull	9%	10%	11%	—	—	—	—	—
Manoeuvre TL	15	16	17	—	—	—	—	—
Reaction Drive Rating	9	10	11	12	13	14	15	16
% of Hull	18%	20%	22%	24%	26%	28%	30%	32%
Reaction TL	9	10	10	10	11	11	11	12

Jump Potential

Rating	1	2	3	4	5	6	7	8	9
% of Hull + 5 tons	2.5%	5%	7.5%	10%	12.5%	15%	17.5%	20%	22.5%
Jump TL	9	11	12	13	14	15	16	17	18

MANOEUVRE AND REACTION DRIVES

A manoeuvre or reaction drive with Thrust 0 allows for an orbiting space station to maintain position but is not sufficient to move the hull any great distance.

Manoeuvre drive systems include thrusters and gravitic compensation (also called G compensators). Without G compensators, the sustained or heavy application of thrust (or g-force) quickly becomes unbearable for most sophonts, initially causing discomfort and eventually unconsciousness, internal injury and death. Gravitic compensators are limited to the thrust rating of the ship; for example, a ship with 2G of thrust can only compensate for 2G of acceleration. Artificial Gravity uses similar technology but can only be used to generate internal gravity and does not serve as a substitute for the G-compensation provided by a manoeuvre drive.

Manoeuvre drives cost MCr2 per ton. Reaction drives cost MCr0.2 per ton.

JUMP DRIVES

Jump drives follow a very similar pattern. Select the desired jump score and use the figure in the Jump Potential table as the percentage of the ship's hull that the jump drive will consume, then add five tons.

A jump drive must be a minimum of 10 tons and they cost MCr1.5 per ton.

STEP 3: INSTALL POWER PLANT

The heart of a spacecraft is the power plant. Typically fusion-based, the power plant meets all the energy requirements for every system on the ship, from the massive amounts required for jump and manoeuvre drives to the expresso machine in the captain's stateroom. Ships are typically built with power plants large enough to supply energy to all systems on a ship without interruption, although some cheaper vessels might require that weapons and other systems are powered off while making a jump, for example.

The Power Plant table illustrates the types of power plant available by Tech Level, as well as how much Power they generate and their cost per ton.

POWER REQUIREMENTS

There are three main requirements a power plant must meet in terms of Power needed by a ship.

Basic Ship Systems: This includes everything a ship needs for day-to-day operations, including artificial gravity, heating, lighting and life support. The amount of Power needed for basic ship systems is equal to 20% of the total tonnage of the hull.

INTERNAL GRAVITY

Artificial gravity allows Travellers to stand upright while perpendicular to the plane of thrust. Ships without this technology require spinning toruses, linear acceleration or some other mechanism to simulate gravity. The artificial gravity system uses similar technology to that of the manoeuvre drive and G compensators.

Manoeuvre Drive: In order to use the manoeuvre drive, the ship requires an amount of Power equal to 10% of the hull's total tonnage multiplied by the maximum Thrust the drive is capable of (multiply by 0.25 if the ship is capable only of Thrust 0). Note that reaction drives do *not* require Power.

Jump Drive: In order to use the jump drive, the ship requires an amount of Power equal to 10% of the hull's total tonnage multiplied by the maximum jump number the drive is capable of. Only fusion and antimatter power plants can generate the intense burst of energy necessary to operate a jump drive. In either case, the power plant must be used to inject hydrogen into a jump bubble, so alternative fuels cannot be used. Note that this Power requirement is only needed when the ship actually initiates a jump – at all other times, the jump drive remains inert.

It is considered good practice to ensure there is enough Power available to use the basic ship systems and the manoeuvre drive simultaneously – being able to use the jump drive at the same time without taking power from other systems is considered a good advantage. You should also note that most weapons and certain types of equipment require additional Power, as noted in their descriptions in the following chapters.

Power Plant

Type	Power per Ton	Cost per Ton
Fission (TL6)	8	MCr0.4
Chemical (TL7)	5	MCr0.25
Fusion (TL8)	10	MCr0.5
Fusion (TL12)	15	MCr1
Fusion (TL15)	20	MCr2
Antimatter (TL20)	100	MCr10

NOT ENOUGH POWER, CAP'N!

There are several ways a ship can run out of power, from suffering damage in combat to designs that require certain systems to be switched off in order for others to function. Fortunately, ships have many systems that are less than vital and these can be temporarily powered down without much loss of function, as covered on page 179 of the *Traveller Core Rulebook*, under Basic Ship Systems.

While the Power required for basic ship systems can be halved in emergencies, a ship may lack enough Power to keep just these systems running.

If a ship cannot run basic ship systems at even half power, the following happens (and the Referee is free to impose other, perhaps harsher, penalties):

- Life support stops functioning efficiently. While the crew does not freeze or suffocate immediately, the ship gradually becomes more uncomfortable. Eventually, the breathable atmosphere is expended and the temperature drops to unsurvivable levels, typically in D3+3 days.
- Iris valves, cargo hatches and automatic doors cease to function, locking in open or closed positions, just as they were when the power failed. Manual overrides must be made and cranks or other devices used to open and close these portals.
- Even if Power can be supplied to the ship's computer, individual terminals throughout the ship cease to function, with the exception of those on the bridge.
- The grav plating throughout the ship ceases to function, creating zero-G conditions.
- Shipboard communications systems (such as the intercom) cease to function, reducing the crew to the use of personal communicators or shouting.

STEP 4:
INSTALL FUEL TANKS

All ships require fuel to function and the total fuel tankage for a ship must be indicated in the design plans. There is no cost associated with space allocated to fuel tanks but their capacity determines how often the ship must refuel.

MANOEUVRING

Manoeuvre drives do not require fuel, although reaction drives do.

The amount of fuel a reaction drive requires is determined as a percentage of the ship's total tonnage and is equal to 2.5% per Thrust per hour.

So, a ship capable of Thrust 4 requires 10% of the ship's tonnage as fuel for every hour of use. If you wanted this ship's reaction drive to be able to function for four hours, it requires 40% of its tonnage to be allocated as fuel tanks.

In combat, it is convenient to multiply the Thrust the ship is capable of by the number of hours it can operate and then multiply that again by 10 to obtain a Total Thrust. Because there are 10 combat rounds every hour, you can then simply deduct every Thrust point the ship uses in combat from the Total Thrust. When it reaches zero, the ship has run out of fuel for its reaction drive. Reaction 0 drives require 0.25 tons of fuel per hour of Thrust.

JUMP DRIVES

The fuel tankage needed for a jump drive is related to the size of the ship and the length of the jump, as follows: 10% of the total tonnage of the ship, multiplied by the maximum jump score of the drive. The result of this is the number of tons that needs to be dedicated to jump fuel.

POWER PLANTS

Chemical power plants require 10 tons of fuel per ton of power plant for every two weeks of operation. Other power plants require fuel tankage equal to 10% of their size (rounding up, minimum 1 ton) per month of operation. This provides enough fuel for the power plant for a month (four weeks). This can be extended further by increasing the fuel tankage for the power plant (so, doubling it will provides twice the number of weeks and so on).

STEP 5:
INSTALL BRIDGE

All ships must have a bridge that contains basic controls, communications equipment, avionics, scanners, detectors, sensors and other equipment for proper operation of the ship. The size of the bridge varies depending on the size of the ship and can range from a massive deck with multiple crew positions on a capital ship to a snug single-seat cockpit in a fighter.

The size of bridge required and its cost are shown on the Bridges table.

Bridges

Size of Ship	Size of Bridge
50 tons or less	3 tons
51–99 tons	6 tons
100–200 tons	10 tons
201–1,000 tons	20 tons
1,001–2,000 tons	40 tons
2,001–100,000 tons	60 tons
100,001 tons+	+20 tons for every additional 100,000 tons of ship

The cost of any bridge is MCr0.5 per 100 tons (or part of) of the ship it is installed within.

SMALLER BRIDGES

It is possible to install a smaller bridge than a ship should normally have. This is usually done to save space or money.

A ship can have a bridge one size smaller than the Bridges table indicates, halving the cost of the bridge. For example, a 100-ton scout could be built with a six ton bridge.

A ship with a smaller bridge suffers DM-1 for all checks related to spacecraft operations made from within the bridge (for example, Astrogation and Pilot checks).

COMMAND BRIDGES

A command bridge is used by ships that lead squadrons or entire fleets, where the control of large regions of space and management of multiple ships is critical. A command bridge adds 40 tons to an existing bridge, can be used by any ship of more than 5,000 tons and adds an additional MCr30 to the cost of the bridge. The command bridge grants DM+1 to all Tactics (naval) checks made within it.

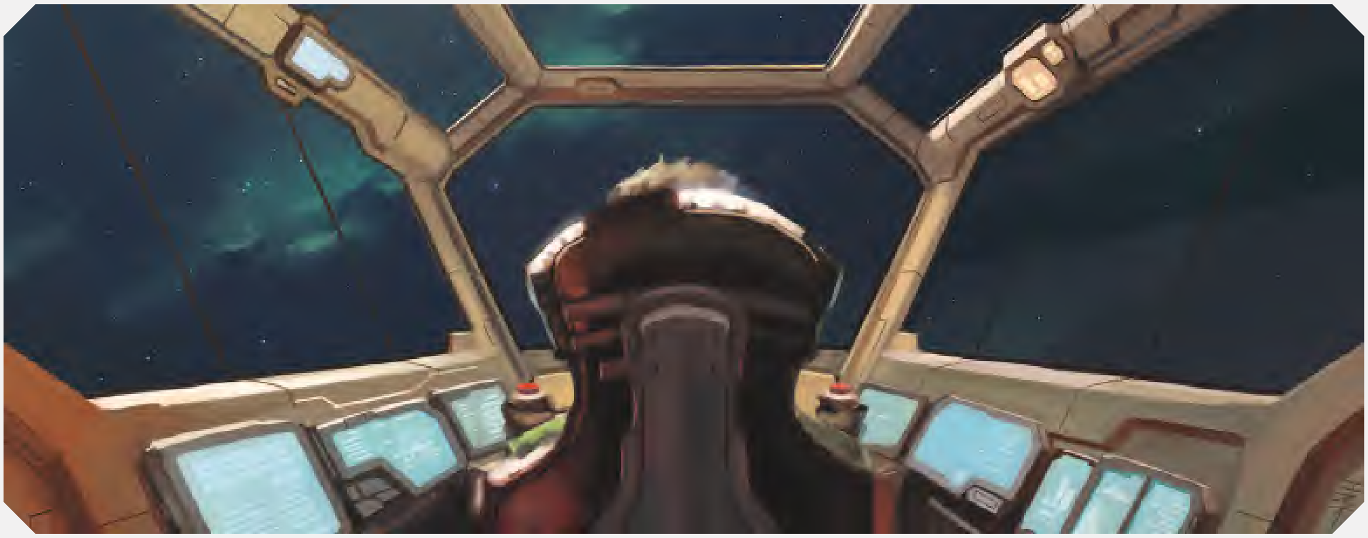
COCKPITS

Instead of a bridge, ships of 50 tons or less may install a cockpit. This is a self-contained, sealed area that contains a single seat and all controls necessary for the operation of the ship. Cockpits are typically entered via an external hatch or canopy; therefore, ships using them do not automatically include an airlock.

A cockpit consumes 1.5 ton of space and costs Cr10000.

A dual cockpit provides space for an additional crew member, such as a sensor operator or gunner. This consumes 2.5 tons of space and costs Cr15000.

A cockpit is not designed for long term use and only has life support for 24 hours.



STEP 6: INSTALL COMPUTER

Every ship needs a central computer, usually installed near the bridge. The computer is the heart of the ship, controlling all functions from life support to the complex calculations needed to perform a jump.

Computers are identified by their model number and the Computers table indicates their price, capacity and Tech Level. In general, larger and more powerful computers are advantageous in combat. The computers installed in a ship work just like personal computers (see the *Traveller Core Rulebook* page 110) but are considerably more powerful because the software needed for ship operations requires a great deal of processing power (see The Ship's Computer on page 73).

Computers

Processing	Tech Level	Cost
Computer/5	7	Cr30000
Computer/10	9	Cr160000
Computer/15	11	MCr2
Computer/20	12	MCr5
Computer/25	13	MCr10
Computer/30	14	MCr20
Computer/35	15	MCr30

Computers do not consume any tonnage on a ship – while they do have a physical presence, they are distributed throughout the ship and considered part of other components such as the bridge, staterooms and drives. A ship may have a maximum of two computers (a primary and a backup) but the second must have a lower Processing score than the primary. The primary and backup computers cannot be operated simultaneously.

COMPUTER TECH LEVELS

Note that the listed Tech Level of a computer is the minimum at which a given computer model is available. The operating Tech Level is that of the starship in which it is installed; therefore, ships can use software limited to the Tech Level of the ship, not the computer. For example, a TL12 trader can use TL12 software even on a Computer/5.

COMPUTER CORES

Most capital ships, and certain specialised vessels, have multiple distributed computer networks spread throughout their decks but always include a central computer core that controls the ship's jump drive. These are extremely powerful computing systems with massive amounts of processing power available.

Computer Cores

Processing	TL	Cost
Core/40	9	MCr45
Core/50	10	MCr60
Core/60	11	MCr75
Core/70	12	MCr80
Core/80	13	MCr95
Core/90	14	MCr120
Core/100	15	MCr130

The Processing score for a computer core is in addition to the processing power needed for Jump Control programs, with all Jump Control software included in the price of the core. Other software must be added at extra cost as normal.

COMPUTER OPTIONS

There are two additional options to consider when fitting a ship's computer:

Jump Control Specialisation (/bis): A computer's Processing score is increased by +5 for the purposes of running Jump Control programs only. This increases the computer's cost by +50%.

Hardened Systems (/fib): A computer and its connections can be Hardened against attack by electromagnetic pulse weapons. A hardened computer is immune to Ion weapons but costs +50% more.

Both options can be applied to the same computer by doubling its cost (+100%).

STEP 7:
INSTALL SENSORS

All ships come equipped with basic communications, sensor and emission-control suites, usually as part of their bridge. However, specialised or military ships often benefit from more advanced systems that are far more sensitive and resistant to jamming.

The DM column in the Sensors table is applied to all Electronics (comms) and Electronics (sensors) checks made by crew in the ship. All ships have Basic sensors unless upgraded.

Sensors

Sensors	TL	Suite	DM	Power	Tons	Cost
Basic	8	Lidar, Radar	-4	0	—	—
Civilian Grade	9	Lidar, Radar	-2	1	1	MCr3
Military Grade	10	Jammers, Lidar, Radar	+0	2	2	MCr4.1
Improved	12	Densitometer, Jammers, Lidar, Radar	+1	4	3	MCr4.3
Advanced	15	Densitometer, Jammers, Lidar, Neural Activity Sensor, Radar	+2	6	5	MCr5.3

STEP 8:
INSTALL WEAPONS

Military ships use a broad range of weaponry to project power but even a humble merchant or scout might find a weaponised turret a useful addition when straying into rougher star systems.

Weapons are installed in the same way as components, taking note of the tonnage they consume within the hull and their cost. Most weapons also have a Power cost associated with them, so you should ensure your power plant is large enough to handle all the needs of the spacecraft after weapons have been installed.

Specific details of weapons (and defensive screens) and how they are installed in a ship can be found in the next chapter.

STEP 9:
INSTALL OPTIONAL SYSTEMS

There are a multitude of optional systems, components and other accessories that can be added to a ship. These are covered in the Spacecraft Options chapter, page 43.

Note that most of these optional systems consume tonnage and some also require Power, both of which must be carefully considered in ship designs.

STEP 10: DETERMINE CREW

All ships, regardless of their Tech Level and automation, require crew on board to run each system and perform necessary duties. The smallest of ships can get away with just one or two multi-skilled individuals but the largest capital ships may need thousands.

The Crew Requirements table shows how many crew are needed for a commercial or adventuring ship and how many are usually found on a military vessel. Salary can vary but the values on the Crew Requirements table shows a monthly average for skill level 1 crew, with the presumption that +50% will be added for every skill level above this.

Note that these are the crew levels a ship *should* have. When Travellers get their hands on a ship, they may want to do things a little differently and this is handled as described in Small Star Ships below.

SMALL CRAFT

Ships of 100 tons or less that do not possess a jump drive typically have a single pilot. The journeys undertaken by such ships are generally short and it is assumed that regular maintenance removes the need for mid-voyage engineering.

Specialised small craft, such as those engaged in scientific work or with separate weapon stations may function more efficiently with more crew but they are not strictly necessary for the operation of the ship.

SMALL STARSHIPS

Spacecraft in the hands of small-time traders or adventurers usually run with a bare minimum of crew, with personnel often fulfilling more than one role as situations demand. For example, it is common on a smaller ship for the pilot to also act as the astrogator, or a steward to have basic medical skills. This keeps the monthly salary bill low and increases what might otherwise be very slim profits.

Ships of less than 1,000 tons can, in theory, be run by just one or two multi-skilled people,but the ship will be at a serious disadvantage in high-stress situations such as combat. The crewman acting as pilot will likely be kept busy in the bridge, actually flying the ship, while another might find their attention split between engineering, damage control and the weapon systems – a quick look at the Crew Duties section on page 164 of the *Traveller Core Rulebook* demonstrates how inefficient this can be.

Note that smaller craft carried by a ship may have their own crew in addition to those necessary for the mother vessel.

LARGE SHIPS

The number of crew required to effectively operate a ship increases enormously with the size of the vessel, but large ships have more efficient centralisation of systems. For ships of more than 5,000 tons, the Referee can reduce the required crew by multiplying the crew complement by the Crew Reduction Multipler in the Crew Reduction table. For example, for a 10,000-ton ship, multiply the total crew by 0.75 to get the final total number of required crew for a given position.

Crew reductions can only be applied to the following roles: engineer, maintenance, gunner, administrators and sensor operators. Calculate officers and medics after reducing the other roles.

Reduced gunnery staff operate multiple weapons in batteries which are managed by capital ships' considerably larger and more extensive computer networks.

Crew Reduction

Ship Size	Crew Reduction Multiplier
5,001–19,999	75%
20,000–49,999	67%
50,000–99,999	50%
100,000+	33%

Crew Requirements

Position	Skills	Salary	Commercial	Military
Captain	—	Cr10000	Usually the leading officer	1
Pilot	Pilot	Cr6000	1 plus 1 for each small craft	3 plus 1 for each small craft
Astrogator	Astrogation	Cr5000	1 if jump drive installed	1 if jump drive installed
Engineer	Engineer	Cr4000	1 per 35 tons of drives and power plant of ship and small craft	1 per 35 tons of drives and power plant of ship and small craft
Maintenance	Mechanic	Cr1000	1 per 1,000 tons of ship and contained small craft	1 per 500 tons of ship and contained small craft
Gunner	Gunner	Cr2000	1 per turret, barbette and screen (bay and spinal weapons require military crewing)	1 per small bay; 2 per turret, barbette, medium bay and screen; 4 per large bay; 1 per 100 tons of spinal mount weaponry
Steward	Steward	Cr2000	1 per 10 High or 100 Middle passengers	1 per 10 High or 100 Middle passengers
Administrator	Admin	Cr1500	1 per 2,000 tons of ship	1 per 1,000 tons of ship
Sensor Operator	Electronics (sensors)	Cr4000	1 per 7,500 tons of ship	3 per 7,500 tons of ship
Medic	Medic	Cr4000	1 per 120 crew and passengers	1 per 120 crew
Officer	Leadership or Persuade	Cr5000*	1 per full 20 crew	1 per full 10 crew

* This is presumed to be an average taken across all officer positions on a ship. In practice, it varies a great deal between junior and senior officers.

STEP 11: INSTALL STATEROOMS

Staterooms represent the living space for both crew and passengers on ships. A single stateroom contains living and sleeping facilities, including a bed, fresher and a very basic kitchen.

Each stateroom consumes four tons and costs MCr0.5. Most ships allocate one person to each stateroom.

DOUBLE OCCUPANCY

Some ships have bunks in their staterooms rather than single beds, allowing two people to share the same stateroom. This is called double occupancy and is often done on exploratory ships, privately-owned vessels and, especially, military ships.

Employing double occupancy on a ship does not cost anything (which is why many commercial captains insist on it) but lack of privacy for extended periods of time can quickly wear on crew not used to it.

LOW BERTHS

A low berth provides suspended animation facilities for emergencies and low-paying passengers. They are not always safe to use but take up relatively little space and power.

A low berth can hold one passenger. It consumes half a ton and costs Cr50000. Low berths require 1 Power for every 10 berths or portion thereof.

EMERGENCY LOW BERTHS

These are compact low berth suites, designed to be used in extreme emergencies, such as if a crewman develops a medical condition that cannot be cured on ship or if the ship is stranded for an extended period of time. An emergency low berth can hold up to four people in dire circumstances. It consumes one ton, costs MCr1 and requires 1 Power.

COMMON AREAS AND LIVING SPACE

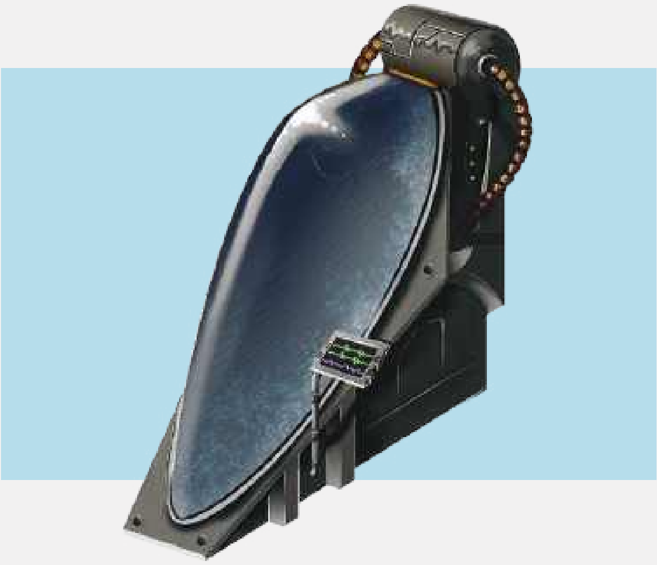
It is common practice to assign an additional amount of tonnage, perhaps equal to a quarter of that used for staterooms, as common areas or general living space. These are typically recreation areas such as a mess, canteen or lounge and can provide facilities such as parks, pools, theatres and so on, for the amusement and entertainment of visiting crew and passengers.

This is not strictly necessary and ships can and will vary in this allocation, either increasing it to give crews and passengers a more luxurious and comfortable journey or cutting back to give more space to useful components, at a cost to crew comfort.

Common areas cost MCr0.1 per ton.

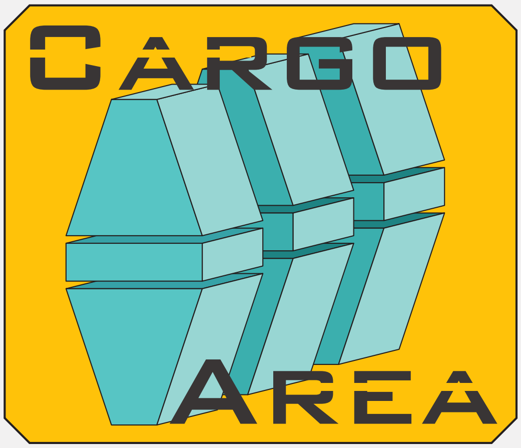
COMMON DECENCY

Designing a ship with less than the recommended common area space is tempting, especially when space is at a premium and the designer wants to fit in as many options as possible. However, ships that do not include a recreational area for their crews to unwind often pay the consequences. Crew fatigue can set in for personnel who have been aboard ship too long without a suitable place to relax other than their staterooms. Initially this might be irritability and a lack of cooperativeness but eventually could affect efficiency and performance, resulting in negative DMs on skill checks.



STEP 12: ALLOCATE CARGO SPACE

Any space left on the ship that has not been allocated to other components is considered to be free for cargo. There is no cost associated with areas designated for cargo but any cargo or other materials taken on board the ship can obviously not exceed the tonnage set aside for cargo.



STEP 13: FINALISE DESIGN

Once cargo space has been allocated, the design process has been completed – your ship is now ready to fly.

Add up the tonnage consumed by all components to ensure that the available space has not been exceeded and add up the prices of all components to determine the cost of the ship. If the ship must be revised, now is the time.

Once everything has been double-checked, record all the details of the ship on a handy sheet, downloadable from the Mongoose Publishing website. Optionally sketch out a deck plan using the guidelines found on page 100.

Determine the monthly maintenance cost of the ship by taking the total cost of the ship (after the 10% discount, if applicable) and divide this figure by 12,000.

Calculate the monthly life support cost. This might be more difficult on ships belonging to Travellers, since the number of people on board can vary, but such ships are generally small enough that this is not a burden to calculate on a month-to-month basis.

With that step complete, the ship is now ready for the Travellers to walk onto the bridge, take command and set sail for the stars!

AIRLOCKS

Airlocks are sealed systems consisting of two heavy-duty doors or iris valves, with atmospheric pumping equipment, allowing transit to and from a spacecraft in a vacuum or hostile atmosphere. A ship may have one airlock for every full 100 tons at no additional expense. Additional airlocks may be purchased as described in the Spacecraft Options chapter. The average airlock is large enough for three people in vacc suits to pass through. An airlock takes 10 seconds to cycle. Under normal circumstances, airlocks are locked down from the bridge and require a Very Difficult (12+) Electronics (computers) check to override from either the interior or exterior of the ship. An unlocked airlock can be triggered from outside.

Small craft do not automatically include airlocks. Additional airlocks may be added as described in the Spacecraft Options chapter.

CARGO HATCHES

Any area designated for cargo can be given a cargo hatch of any size but this is not an airlock. Generally speaking, cargo areas are capable of being sealed, and so are effectively one large airlock unto themselves, but this can cause problems when needing to unload cargo in a hostile environment. See the description of cargo airlocks on page 58 for a solution.

WEAPONS AND SCREENS

From a single-turret laser on a free trader intended to discourage piracy, to the massive spinal weapons that battleships are built around, weapons (both offensive and defensive) are an important component for many ships. This chapter explores the vast range of options available to spacecraft architects who want to weaponise their creations.

It should be noted that all weapons in this chapter are Spacecraft scale (see *Traveller Core Rulebook,* page 167).

NUMBER OF WEAPONS

There are only so many weapons that can be attached to a ship, the limiting factors being the supply of energy, the stresses imposed upon the hull through the use of high-powered weaponry and the surface area of a hull it is possible to cover with weapons.

Spacecraft therefore have a maximum number of Hardpoints to which weapons can be attached. A ship has one Hardpoint for every 100 tons of hull. The Hardpoints table shows how many Hardpoints are used by each weapon type.

Hardpoints

Weapon System	Hardpoints Used
Fixed Mount	1
Turret	1
Barbette	1
Small Bay	1
Medium Bay	1
Large Bay	5
Spinal Mount	Weapon Tonnage/100

SMALL CRAFT

Ships of less than 100 tons have Firmpoints instead of Hardpoints. A Firmpoint is a fixed mount, typically forward-facing but may alternatively point in any desired direction.

A ship of less than 35 tons has one Firmpoint. A ship of 35–69 tons has two Firmpoints and a ship of 70–99 tons has three Firmpoints. Beyond this size, ships use Hardpoints. A firmpoint can hold only one weapon.

One (and only one) Firmpoint can be upgraded to a single (not double or triple) turret, which may fire in all directions as normal.

A weapon mounted on a Firmpoint has the following changes applied to it:

- Weapons of Medium range or less are reduced to Adjacent range.
- Weapons of Long or greater are reduced to Close range.
- A weapon on a Firmpoint may not have its range increased beyond Close by any means.
- Firmpoint range limitations do not apply to missiles and torpedoes.
- Power requirements of the weapon are reduced by 25% (rounding up).
- Barbettes consume three Firmpoints.

SYSTEM DEFENCE AND SENSORS

The *Traveller Core Rulebook* covers ranges in space up to Distant but this is still a relatively short distance in astronomical terms. When constructing fleets and space stations, Referees may find it useful to consider ranges above Distant.

When using these rules, Distant covers ranges up to 300,000km, which is the maximum practical range that attacks can be made. However, it is possible for sensors to reach further in order to detect incoming threats. The following new range bands reflect this.

Very Distant (up to 5,000,000km): All Electronics (sensors) checks become Formidable (14+).
Far (over 5,000,000km): At these ranges, sensors can spot the signature of ships making jumps (inbound or out) and can determine only whether a contact is a ship or other similar-sized astronomical body. In either case, sensors are only able to determine the size of the contact to the nearest 10,000 tons.

Immense size is also a factor in detection and it can be a real trial trying to creep up on a starport with a dreadnought. Attempts to detect ships of 100,000 tons or greater gain DM+2, while attempts to detect ships of 500,000 tons or greater gain DM+4.

CRITICAL HITS ON LARGE SHIPS

Large ships can absorb a tremendous amount of damage. During space combat, use the standard Critical Hits rules from the *Traveller Core Rulebook* with the following modifications:

- Ships larger than 2,000 tons ignore critical hits from turrets and barbettes.
- Ships larger than 10,000 tons ignore critical hits from all weapons except medium and large bay weapons and spinal-mount weapons.
- Ships larger than 100,000 tons ignore critical hits from all weapons except large bays and spinal-mount weapons.
- Spinal mount weapons can always (and will!) cause critical hits.

All ships, even the largest, suffer critical hits from Sustained Damage (see page 170 of the *Traveller Core Rulebook*) as normal.

CRITICAL HITS TABLE FOR LARGE SHIPS

The Critical Hits table in the *Traveller Core Rulebook* works well for ship battles between smaller ships but when two large ships square off, some adjustments are needed: cargo, crew and weapons.

Cargo critical hits work well for small ships but not for large ones of more than 5,000 tons. If the ship does not have significant cargo space, include vehicles, small craft, passengers (including low berths) and other major systems when considering the effects of a Cargo critical hit. Optionally build a D6 table for the ship in question. for example, the D6 table for a large military carrier might be 1–2: fighters, 3: other small craft, 4: frozen watch, 5–6: cargo. Then use the Cargo and Weapons Critical Hit Severity table to determine the extent of damage.

If a Weapons critical hit is scored on a large ship by another large ship, choose randomly between the weapon systems on the ship. If the weapons are multiple (turrets, barbettes, bays, point-defence batteries, ammunition storage), use the Cargo and Weapons Critical Hit Severity table to determine what has been disabled or destroyed. For example, if the Referee randomly determines that the ship's 100 medium missile bays have been hit and the Severity is 2, then D3 x 10% is rolled to determine the percentage of those weapons that are disabled.

Cargo and Weapons Critical Hit Severity

Severity	Result
1	2D6% disabled/injured
2	D3 x 10% disabled/injured
3	1D x 10% destroyed/killed
4	All remaining destroyed/killed
5	All remaining destroyed/killed, Hull Severity increased by +1
6	All remaining destroyed/killed, Hull Severity increased by +1

For Crew critical hits on large ships, see the Crew Critical Hit Severity table.

Crew Critical Hit Severity

Severity	Result
1	1% of crew killed/disabled
2	5% of crew killed/disabled; life support fails in 1D hours
3	10% of crew killed/disabled; DM-1 to all checks unless crew restored above 90%
4	15% of crew killed/disabled; life support fails in 1D rounds
5	20% of crew killed/disabled; DM-2 to all checks unless crew restored above 70%
6	25% of crew killed/disabled; life support fails, DM-4 to all checks unless crew restored above 25%

FROZEN WATCH

A frozen watch consists of 'spare' crew members held in low berths until needed. It is presumed to include representative members of all departments. When Crew critical hits have been sustained, the player in control of the affected ship may choose to revive any number of frozen-watch crew members, who replace disabled or killed crew members the following turn, thereby 'repairing' Crew critical hits.

TURRETS AND FIXED MOUNTS

Turrets and fixed mounts use the same type of weapons but whereas a fixed mount can only fire at targets directly ahead of it, a turret rotates and can engage any target in sight. One turret or fixed mount may be attached to each Hardpoint on a ship.

Turrets

Mount	TL	Power	Tons	Cost
Fixed Mount	—	0	0	MCr0.1
Single Turret	7	1	1	MCr0.2
Double Turret	8	1	1	MCr0.5
Triple Turret	9	1	1	MCr1
Pop-Up Mounting	10	+0	+1	MCr1

Up to three weapons may be mounted on a fixed mount (small craft have additional limitations), while turrets can mount one, two or three weapons, depending on their type. These weapons need not be of the same type but only one type may be used in the same attack.

If two or more weapons are of the same type, they may be fired together. One attack roll is made for all weapons being fired but each additional weapon adds +1 per damage dice to the final damage total.

For example, if a triple turret with three pulse lasers is fired, it makes one attack roll but inflicts 2D+4 damage (two additional pulse lasers each adding +1 per damage dice).

Turrets and fixed mounts require just one gunner to operate, even if multiple weapons are mounted upon them.

Pop-Up Mounting: This can be applied to any turret or fixed mount. The weapon system is concealed in a pod or recess on the hull, and detectable only when deployed. A ship with all its weapons hidden in popup mounts will appear unarmed to a sensor scan that focuses only on its exterior.

BEAM LASER

A laser weapon that fires a continuous beam, allowing targets to be tracked and hit more easily. Beam lasers are more accurate than pulse lasers but have shorter range and do less damage. Beam laser turrets receive DM+4 to attack rolls.

FUSION GUN

An extremely powerful weapon in planet-based warfare, in space the fusion gun provides hard-hitting strikes at a reasonable cost. However, it is extremely power-hungry.

LASER DRILL

This is more of a tool than a weapon, used by belters to penetrate asteroids in order to reach valuable ores. Salvagers also use laser drills to gain entry into derelict ships. However, in an emergency, the laser drill makes for a potent, if very short-ranged, weapon. The laser drill suffers DM-3 to attack rolls if used as a weapon.

MISSILE RACK

Although missile racks require ammunition and the warheads take time to reach distant targets, they can be very powerful weapons and, when a range of warheads is available, extremely versatile too. Each turret with one or more missile racks holds 12 missiles (missile racks on Firmpoints hold four missiles). The missile rack listed in the table is equipped with standard missiles.

Turret Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Beam Laser	10	Medium	4	1D	MCr0.5	—
Fusion Gun	14	Medium	12	4D	MCr2	Radiation
Laser Drill	8	Adjacent	4	2D	Cr150000	AP 4
Missile Rack	7	Special	0	4D	MCr0.75	Smart
Particle Beam	12	Very Long	8	3D	MCr4	Radiation
Plasma Gun	11	Medium	6	3D	MCr2.5	—
Pulse Laser	9	Long	4	2D	MCr1	—
Railgun	10	Short	2	2D	MCr1	AP 4
Sandcaster	9	Special	0	Special	MCr0.25	—

PARTICLE BEAM
This weapon fires a stream of accelerated subatomic particles at a target. It is not only more powerful than the average ship-mounted laser but some of the particles it fires easily penetrate ship armour as if it were not there, irradiating the crew on board.

PLASMA GUN
Firing a high-energy plasma stream, this weapon is far more powerful than equivalent lasers and provides a good balance between cost and hitting power.

PULSE LASER
Using capacitors to discharge its energy in a single powerful blast, the pulse laser is less accurate than its beam-based counterpart but has longer range and does more damage. Pulse laser turrets receive DM+2 to attack rolls.

RAILGUN
Using electromagnetic force, railguns accelerate slug ammunition to fractions of the speed of light, delivering a heavy kinetic-energy blow. Railgun turrets contain enough ammunition for 12 attacks each. Each cannister of railgun ammunition consumes one ton and costs Cr5000.

DAMAGE MULTIPLES
Barbettes, bay weapons and spinal mount weapons have damage multiples. After a hit is scored, roll damage, subtracting armour and other countermeasures from the total. Be sure to subtract AP from the armour before reducing damage. Multiply the remaining damage by the Damage Multiple for the final damage.

Damage Multiples

Weapon Type	Damage Multiple
Barbette	3
Small Bay	10
Medium Bay	20
Large Bay	100
Spinal Mounts	1,000

Damage multiples do not apply to missiles and torpedoes.

SANDCASTER
Although mounted in turrets and of use against boarders, the sandcaster is primarily a defensive weapon used to protect ships from laser, energy and particle weapons. Each Hardpoint-mounted sandcaster holds 20 sand canisters and costs Cr25000 to refill. Sandcasters on Firmpoints hold four canisters and cost Cr5000 to refill.

BARBETTES
Barbettes are effectively heavy turrets. Barbettes are typically only for military use and not available for purchase by civilians except under unusual circumstances. However, there are unscrupulous ports where they can be obtained on the black market.

A barbette uses a single Hardpoint, and requires the Gunner (turret) skill but also consumes additional tonnage inside the ship, as its larger weapons need more space for capacitors, targeting mechanisms, ammunition feeds and other components. Like turrets, barbettes require just one gunner to operate. Most barbettes consume 5 tons each.

Barbette Damage Multiple 3

BEAM LASER BARBETTE
Beam laser barbettes are essentially heavier hitting versions of turret lasers. At mid-stellar Tech Levels, laser barbettes are superseded by more powerful particle and fusion-based barbettes, especially on military spacecraft. Beam laser barbettes retain the advantages and disadvantages of turret lasers but cannot be used for point defence, as with any other barbette. Beam laser barbettes receive DM+4 to attack rolls.

FUSION BARBETTE
An extremely powerful weapon in planet-based warfare, in space the fusion barbette provides hard-hitting strikes at a reasonable cost. However, it is a power-hungry weapon.

ION CANNON
This weapon disrupts the systems of the target ship. Ion weapons are typically used to temporarily disable enemy ships, stopping them from fleeing or attacking while a position of advantage can be attained. For this reason, they may be found on well-equipped pirate vessels or customs ships.

WEAPON TRAITS: ORBITAL BOMBARDMENT AND ORBITAL STRIKE

Orbital bombardment and strike weapons require the Gunnery (ortillery) skill to use. These traits reflect weapons optimised to strike ground-based targets. Also see Spacecraft Damage Scale in the *Traveller Core Rulebook*, page 167, which applies whether these traits are present or not.

Weapons with the Orbital Bombardment trait suffer DM-12 when attacking any target that can manoeuvre in space combat. They suffer no penalty to bombard static orbital installations such as a shipyard or starport. Orbital Bombardment weapons do not have the precision of Orbital Strike weapons, affecting a significant blast area. When attacking Ground scale targets, they add Blast 100 instead of the usual Blast 10.

Weapons with the Orbital Strike trait suffer DM-8 when attacking targets that can manoeuvre in ship combat. They suffer no penalty to bombard static orbital installations such as a shipyard or starport. Orbital Strike weapons are precise, lacking the greater destructive capabilities of Orbital Bombardment weapons. They do not add the Blast 10 trait when attacking Ground scale targets.

WEAPON TRAIT: ION

Ion weapons overload power systems, temporarily disrupting critical systems on board a ship without causing permanent damage. This can give a vital edge in combat while an enemy ship recovers or force an enemy to surrender before the disabling attack is followed up by something far more potent.

Instead of dealing damage as usual, Ion weapons use the following rules.

When an Ion weapon successfully hits a target, roll for its damage but ignore any armour the target possesses. Instead of applying damage to the target's hull, it is instead temporarily deducted from the target's Power, representing the disabling effects as they spread throughout the ship, forcing its crew to reroute power in order to keep the most vital systems online.

This reduction in Power lasts until the target completes its next set of actions, in either the current round or the next.

If the Effect of the attack roll is 6 or more, the reduction in Power lasts for D3 rounds.

Hardened Systems: If a system is listed as being hardened (as with /fib computers, for example), the crew may choose to allocate any Power to it before any deductions for Ion weapons are applied. This ensures a hardened system will always have enough Power to function, provided that the Power was available before the Ion attack.

Barbettes

Weapon	TL	Range	Power	Damage	Cost	Traits
Beam Laser Barbette	10	Medium	12	2D	MCr3	—
Fusion Barbette	12	Medium	20	5D	MCr4	AP 3, Radiation
Ion Cannon	12	Medium	10	7D	MCr6	Ion
Missile Barbette	7	Special	0	4D	MCr4	Smart
Particle Barbette	11	Very Long	15	4D	MCr8	Radiation
Plasma Barbette	11	Medium	12	4D	MCr5	AP 2
Pulse Laser Barbette	9	Long	12	3D	MCr6	—
Railgun Barbette	10	Medium	5	3D	MCr2	AP 5
Torpedo	7	Special	2	6D	MCr3	Smart

MISSILE BARBETTE
Equipped with multilaunchers, a missile barbette can unleash a flurry of warheads at a target. A missile barbette fires five missiles at a time and holds enough missiles for five full salvos (a total of 25 missiles). Missile barbettes on Firmpoints consume an additional two tons of space.

PARTICLE BARBETTE
Taking advantage of the increased power efficiencies and space available to a barbette, this is a much larger particle weapon than those mounted in turrets.

PLASMA BARBETTE
A large plasma weapon, the plasma barbette is capable of smashing through even well-armoured targets.

PULSE LASER BARBETTE
Pulse laser barbettes are essentially heavier hitting versions of turret lasers. At mid-stellar Tech Levels, laser barbettes are superseded by more powerful particle and fusion-based barbettes, especially on military spacecraft. Pulse laser barbettes retain the advantages and disadvantages of turret lasers but cannot be used for point defence, as with any other barbette. Pulse laser barbettes receive DM+2 to attack rolls.

RAILGUN BARBETTE
Railgun barbettes are larger, single-cannon versions of the railgun turret that fire a larger, more damaging round. Railgun barbettes contain enough ammunition for 12 attacks. Each cannister of railgun ammunition consumes two tons and costs Cr10000.

TORPEDO BARBETTE
A torpedo is a heavy anti-ship missile capable of carrying tremendous destructive force. Torpedoes are treated in every way like missiles, although they tend to be a lot more powerful. Each torpedo barbette holds three torpedoes. The torpedo here is equipped with a standard warhead. Torpedo barbetttes on Firmpoints consume an additional two tons of space.

BAYS
For more destructive power than that provided by turrets and barbettes, weapons bays allow ships to concentrate a lot of fire from a single weapon system. However, they do not have the fast-tracking systems found in turrets and consequently find smaller targets harder to score hits upon. Bay weapons are strictly reserved for the military and rarely, if ever, found on civilian spacecraft.

THE RADIATION TRAIT
When a spacecraft weapon with the Radiation trait is fired, it inflicts 2D x 60 rads on everyone within 10 metres of the point of attack. It should be noted that radiation weapons have shielding and other safeguards that prevent them from affecting the gunners who fire the weapon and other crew in the vicinity. However, Travellers on the hull of the attacking ship do risk being affected if they are near the weapon when it fires.

Radiation is simple to apply to low-tonnage ships but more complex when assessing damage to cruisers and battleships that mass in thousands of tons with hundreds or even thousands of crew members.

To keep things simple, without glossing over the effects of accumulating radiation damage on the crew of large vessels, simply apply a cumulative DM-1 to all actions a ship performs for every 10% of Hull it loses to Radiation weapons. If the ship has radiation shielding, increase this to DM-1 every time it loses 40% of its Hull to Radiation weapons.

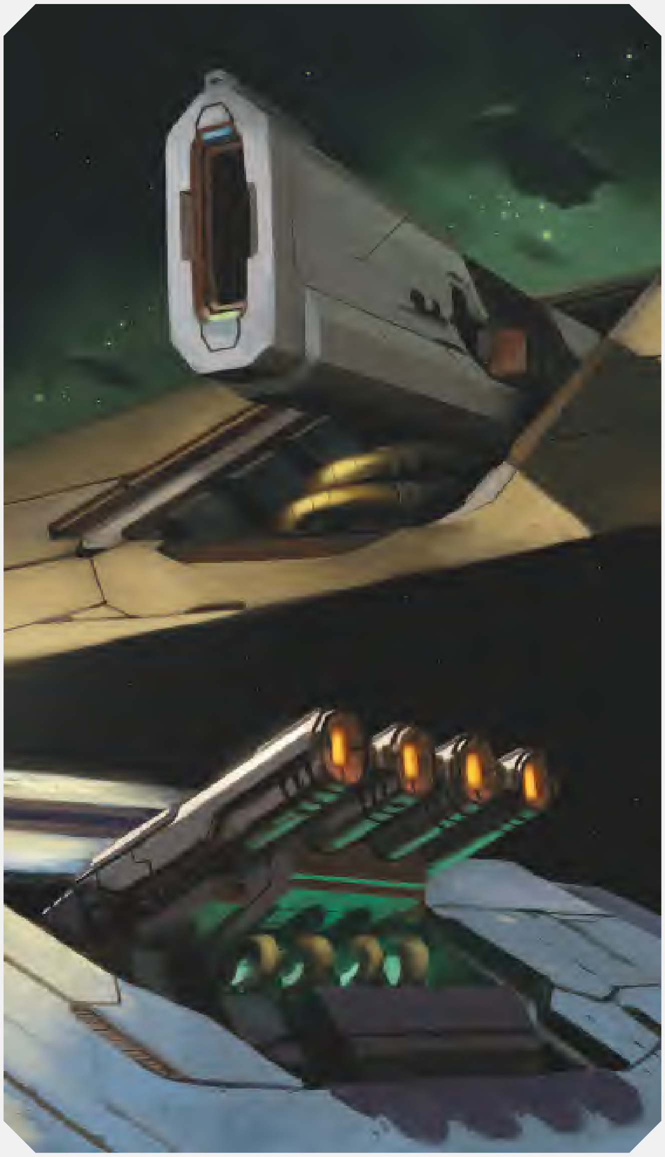
If meson weapons are used, ignore radiation shielding – regardless of the protection the ship has, the crew gets a full dose of radiation from these weapons.

Bays come in three sizes: small, medium and large. They require tonnage, Hardpoints and crew as shown on the Bay Weapons table.

Bay Weapons

Size	Tons	Hardpoints	Crew	Damage Multiple
Small	50	1	1	10
Medium	100	1	2	20
Large	500	5	4	100

To calculate damage for a bay weapon hit, roll the Damage shown for the specific Bay, and multiply the result by the factor shown in the Damage column above. For example, a Medium Meson Gun Bay would do 6D x 20 damage.



All bay weapons suffer DM-2 when attacking targets of 2,000 tons or less and DM-4 when attacking targets of 100 tons or less. Missile and torpedo salvoes do not use these modifiers.

FUSION GUN BAY

Each fusion gun bay mounts one or more massive fusion cannons, capable of blasting apart small vessels with a single shot.

ION CANNON BAY

This weapon disrupts the systems of the target ship. Ion cannon bays allow the focusing of a great deal of energy, potentially causing even small capital ships problems when used in sufficient numbers.

MASS DRIVER BAY

Also known as an ortillery railgun, this weapon fires large, solid projectiles at speeds optimised for smashing planetary targets. Each bay contains enough ammunition for six attacks. Extra or replacement ammunition can be purchased as shown on the Mass Driver Ammunition table.

Mass Driver Ammunition

Mass Driver Bay	Tons/Attack	Cost/Attack
Small	2	Cr20000
Medium	4	Cr40000
Large	20	Cr200000

MESON GUN BAY

Meson guns fire destructive beams that make a mockery of armour and produce intense radiation effects inside a target. Meson gun bays ignore all Armour and radiation shielding.

Small Bay Damage Multiple 10
Medium Bay Damage Multiple 20
Large Bay Damage Multiple 100

Small Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Fusion Gun Bay	12	Medium	50	6D	MCr8	AP 6, Radiation
Ion Cannon Bay	12	Medium	20	6D	MCr15	Ion
Mass Driver Bay	8	Short	15	3D	MCr40	Orbital Bombardment
Meson Gun Bay	11	Long	20	5D	MCr50	AP ∞, Radiation
Missile Bay	7	Special	5	4D	MCr12	Smart
Orbital Strike Mass Driver Bay	10	Short	35	7D	MCr25	Orbital Strike
Orbital Strike Missile Bay	10	Medium	5	3D	MCr16	Orbital Strike
Particle Beam Bay	11	Very Long	30	6D	MCr20	Radiation
Railgun Bay	10	Short	10	3D	MCr30	AP 10
Repulsor Bay	15	Short	50	Special	MCr30	—
Torpedo Bay	7	Special	2	6D	MCr3	Smart

Medium Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Fusion Gun Bay	12	Medium	80	7D	MCr14	AP 6, Radiation
Ion Cannon Bay	12	Medium	30	8D	MCr25	Ion
Mass Driver Bay	8	Short	25	4D	MCr60	Orbital Bombardment
Meson Gun Bay	12	Long	30	6D	MCr60	AP ∞, Radiation
Missile Bay	7	Special	10	4D	MCr20	Smart
Orbital Strike Mass Driver Bay	10	Short	50	10D	MCr35	Orbital Strike
Orbital Strike Missile Bay	10	Medium	15	5D	MCr20	Orbital Strike
Particle Beam Bay	12	Very Long	50	8D	MCr40	Radiation
Railgun Bay	10	Short	15	5D	MCr50	AP 10
Repulsor Bay	14	Short	100	Special	MCr60	—
Torpedo Bay	7	Special	5	6D	MCr6	Smart

Large Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Fusion Gun Bay	12	Long	100	10D	MCr25	AP 8, Radiation
Ion Cannon Bay	12	Long	40	10D	MCr40	Ion
Mass Driver Bay	8	Medium	35	6D	MCr80	Orbital Bombardment
Meson Gun Bay	13	Long	120	6D	MCr250	AP ∞, Radiation
Missile Bay	7	Special	20	4D	MCr25	Smart
Orbital Strike Mass Driver Bay	10	Short	75	12D	MCr50	Orbital Strike
Orbital Strike Missile Bay	10	Medium	25	8D	MCr24	Orbital Strike
Particle Beam Bay	13	Distant	80	10D	MCr60	Radiation
Railgun Bay	10	Medium	25	6D	MCr70	AP 10
Repulsor Bay	13	Short	200	Special	MCr90	—
Torpedo Bay	7	Special	10	6D	MCr10	Smart

MISSILE BAY

Packed full of launchers, a missile bay can unleash salvos of warheads at a target, overwhelming its active defences. A small bay fires 12 missiles at a time, a medium bay fires 24, and a large bay can fire 120 missiles in a single round. Each bay holds enough missiles for 12 full salvos (so, 144 missiles in a small bay, 288 in a medium bay and 1,440 in a large bay).

ORBITAL STRIKE MASS DRIVER BAY

A mass driver bay specifically intended for precise attacks against targets close to population centres or supporting ground forces.

ORBITAL STRIKE MISSILE BAY

A missile driver bay specifically intended for precise attacks against targets close to population centres or supporting ground forces. They carry and fire the same number of missiles as other missile bays but cannot use ordinary missiles, instead using unguided kinetic missiles that cost Cr150000 for 12, have Thrust 6 and inflict 3D damage per missile.

PARTICLE BEAM BAY

The use of a bay allows much larger particle beam weapons to be installed, the largest capable of terrifying firepower that erodes a ship's hull and irradiates enemy crew.

RAILGUN BAY

Although the rounds a railgun uses are low technology armour penetrators, the weapon itself uses electromagnetic forces to accelerate them to sizeable fractions of the speed of light, delivering a high dose of kinetic energy to the target. Railgun bays contain enough ammunition for 12 attacks each. Extra or replacement ammunition can be purchased as shown on the Railgun Ammunition table.

Railgun Ammunition

Railgun Bay	Tons/Attack	Cost/Attack
Small	1	Cr15000
Medium	2	Cr30000
Large	5	Cr75000

REPULSOR BAY

Repulsor bays use gravitics to deflect objects – usually incoming missiles or torpedoes – at great distances. By reversing the polarity of a repulsor, a ship may also use the weapon to pull objects towards it. Repulsors so configured are sometimes called tractor beams.

When used as a repulsor, a successful Gunner (capital) check removes a number of missiles from any salvo within range equal to 1D x Effect. Medium repulsor bays multiply the result by two and large repulsor bays multiply it by five.

When used as a tractor beam, a successful attack roll causes no damage to the target. Small repulsor bays can hold objects of up to 100 tons, medium bays up to 200 tons and large bays up to 800 tons. Multiple repulsor bays can stack to hold larger ships. Objects held by a tractor beam cannot expend Thrust but may be moved by the tractor beam operator as if they had Thrust 1. A ship caught in a tractor beam can attempt to break the lock by making a Pilot check opposed by the Gunner (capital) check of the tractor beam operator. Each additional tractor beam holding the ship imposes DM-2 to this Pilot check and large repulsor bays impose a further DM-2.

A repulsor can only be used once per round, whether it is locking onto an object or repelling it. Increasing the TL of a repulsor bay increases its cost by 10% and doubles the tonnage of the object it can hold. This increase may only be applied once. However, a ship may not lock onto an object of greater tonnage than itself.

TORPEDO BAY

A flurry of missiles will panic any ship's captain but a salvo of torpedoes is real cause for concern. The torpedo bay launches a number of torpedoes with every attack: three torpedoes for a small bay, 6 torpedoes for a medium bay and 30 torpedoes for a large bay. Each bay holds enough torpedoes for 12 full salvos (so, 36 torpedoes in a small bay, 72 in a medium bay and 360 in a large bay).

MULTIPLE WARHEADS INCOMING!

Once ships start mounting bay weapons, the number of missiles they can throw at their enemies increases significantly. When multiple salvoes of missiles (or torpedoes) are incoming, even the finest sensor operator can become quickly overwhelmed. To counter this, large warships often have multiple sensor stations operated by several dedicated crew members.

Because of this, assume that a ship has one on-duty sensor operator for every full 7,500 tons. For example, a 75,000-ton ship would have 10 sensor operators on duty who could between them perform the Electronic Warfare action on 10 different incoming salvoes.

For large ships, the Referee may make one roll for every 10 sensor operators, multiplying the results by 10 for simplicity.

SPINAL WEAPONS

Spinal weapons are the ultimate in ship-borne firepower, huge weapons that run the entire length of a ship. In many cases, a ship will be built around the weapon itself (hence the term 'spinal') and a single shot from a spinal weapon can cut a lesser vessel in two. Spinal weapons are specifically designed to deliver knockout blows against the largest vessels and surface installations. Consequently, they are extremely inaccurate when attacking small targets. It goes without saying that spinal-mount weapons are strictly used by the military.

Spinal Mount Damage Multiple 1,000

All spinal weapons suffer DM-4 when attacking targets of 10,000 tons or less and DM-8 when attacking targets of 5,000 tons or less. Spinal weapons cannot attack targets of less than 2,000 tons unless they are stationary or are caught in the blast by accident. Spinal weapons use a number of Hardpoints equal to their tonnage divided by 100, rounding up. A spinal mount cannot exceed a tonnage equal to half that of the ship carrying it.

In addition, spinal weapons incur negative DMs against ships of all sizes at Adjacent to Short range. While there is some degree of directional adjustment that can be made at the barrel of most spinal weapons, their sheer

Spinal Weapon Range Adjustments

Range Band	Attacking Ship <10,000 tons	Attacking Ship 10,000–50,000 tons	Attacking Ship 50,000–250,000 tons	Attacking Ship >250,000 tons
Adjacent	DM-4	DM-6	DM-8	DM-10
Close	DM-2	DM-4	DM-6	DM-8
Short	DM-1	DM-2	DM-4	DM-6

Spinal Mount Weapons

Weapon	TL	Range	Base Size	Power	Damage	Cost	Max. Size	Traits
Mass Driver	10	Short	5,000 tons	+250	+4D	+MCr1500	100,000 tons	AP 15, Orbital Bombardment
Meson	12	Long	7,500 tons	+1,000	+6D	+MCr2000	75,000 tons	AP ∞, Radiation
Particle	11	Very Long	3,500 tons	+1,000	+8D	+MCr1000	28,000 tons	Radiation
Railgun	10	Medium	3,500 tons	+500	+4D	+MCr500	21,000 tons	AP20

size and dependency on the movement of the host ship limits their ability to accurately target nearby ships. Consult the Spinal Weapon Range Adjustments table.

However, spinal weapons also require vast reserves of power and naval architects might consider using high-efficiency batteries to allow a spinal weapon to be charged over time, rather than requiring a massive power plant that can deliver the required energy all at once.

Note that while there are no restrictions preventing a designer from installing more than one spinal mount weapon in a ship, it is rarely done in the Charted Space universe.

Spinal mount weapons are very large and, unlike other offensive systems, are of variable size. The Spinal Mount Weapons table shows the effectiveness of a spinal mount weapon at its Base Size (this is also its minimum size at the lowest Tech Level the weapon becomes available).

For every multiple of the Base Size, the spinal mount increases its Damage, Power consumption and cost by the amount shown. So, for example, a 15,000-ton meson spinal mount consumes 2,000 Power, deals 12D damage and costs MCr4000. Denote the multiple of the weapon on the ship's record sheet. For example, for a TL15 spinal mount meson weapon with a multiple of 5, display the weapon as 'Spinal – meson (TL15) – 5x'.

For large spinal mounts, the number of damage dice can become quite high. To simplify, divide the damage dice by the desired multiple and then multiply the final amount by the same number. For example, a 75,000-ton meson spinal mount inflicts 60D damage. Instead of rolling 60 dice, divide the damage dice by 10 and then roll only 6D. Multiply the result by 10 to get the preliminary damage and then multiply it by the Damage Multiple of 1,000 for the final damage. Apply damage reduction from any meson screens as normal.

Spinal mounts improve rapidly with technology, while their power and projection systems become smaller and more efficient, allowing them to be placed within smaller vessels, as shown on the Spinal Mount Improvements table.

Spinal Mounts Improvement

TL	Tons	Cost
+1	-10%	+10%
+2	-15%	+20%
+3	-20%	+30%

MASS DRIVER SPINAL MOUNT

Used against precise targets, such as large-scale infrastructure – dams, power generation sites, spaceports and seaports, and so forth – and industrial centres, as well as defensive installations. A bracket impact with deadfall weapons or nuclear detonations can crack hardened underground structures that otherwise might be impervious. The intent is to set up multiple shockwaves that converge on the target and combine to produce extreme forces. Ammunition is 50 tons and costs Cr500000 per attack

MESON SPINAL MOUNT

A truly awe-inspiring weapon, the dual-particle beams used by meson spinal mounts can end battles before they really begin. Meson spinal mounts ignore all armour and radiation shielding.

PARTICLE SPINAL MOUNT

The largest version of a weapon whose development started with humble barbette-based systems, particle spinal mounts are a mainstay of the most powerful navies. The damage dealt by a particle spinal mount is reduced by 3% per point of armour possessed by the target before applying the Damage Multiple.

RAILGUN SPINAL MOUNT

An array of smaller rapid-firing guns, the railgun spinal mount fires much larger rounds at near relativistic speeds. The damage dealt by a railgun spinal mount is reduced by 2% per point of armour possessed by the target before applying the Damage Multiple. Railgun spinal mounts come equipped with five rounds. Extra or replacement rounds consume 20 tons each and cost MCr0.2.

MISSILES

There are several different types of missiles beyond standard warheads. Additional missiles can be purchased for a ship, increasing its stock of ammunition and missiles can be replenished after use. Twelve missiles consume one ton. The listed cost is for 12 missiles.

ADVANCED MISSILE

An advanced version of the standard missile, this model features improved propulsion and a more devastating warhead.

ANTIMATTER MISSILE

Tipped with an antimatter warhead, these missiles are devastating enough in the attack but also release waves of destructive radiation on enemy crews.

ANTI-TORPEDO MISSILE

Taking advantage of the superior speed of missiles and the Smart trait, these missiles are arguably the best defence against torpedo attacks. The anti-torpedo missile has a multiple-component design, featuring a cartridge that contains the primary propulsion unit and Improved Sensors for target location. As the cartridge approaches its target, it launches a smaller, more nimble missile that uses a secondary propulsion unit to close the gap with a torpedo salvo, whereupon it detonates a fragmentary warhead that eliminates 1D + Effect torpedoes from the salvo during the Reaction Step of space combat.

DECOY MISSILE

These missiles have a small warhead but sport a pair of small pods mounted with powerful transmitters and jammers. These are detached shortly before impact, confusing point-defence systems. All anti-missile fire directed at this missile suffers DM-2.

FRAGMENTATION MISSILE

This missile is designed to target small craft. It explodes shortly before interception, throwing out a wall of high-velocity shrapnel. When fired in mass barrages,

Missiles

Weapon	TL	Thrust	Damage	Cost Per 12 Missiles	Traits
Advanced	14	15	5D	Cr350000	Smart
Antimatter	20	15	2DD	MCr1	Radiation, Smart
Anti-Torpedo	13	15	1D*	Cr350000	Smart
Decoy	9	15	2D	Cr150000	Smart
Fragmentation	8	15	3D	Cr200000	Smart
Ion	12	12	Special	Cr750000	Ion
Jumpbreaker	13	10	—	MCr1	Smart
Long Range	8	15	3D	Cr500000	Smart
Multi-Warhead	8	10	3D	Cr750000	Smart
Nuclear	6	10	1DD	Cr450000	Radiation, Smart
Ortillery	7	6	1DD	Cr300000	Orbital Strike
Shockwave	7	10	—	Cr200000	Smart
Standard	7	10	4D	Cr250000	Smart

* Anti-torpedo missiles are highly specialised and therefore do little damage to conventional targets, inflicting only 1D damage.

Antimatter missile

Advanced missile

Long-range missile

Ion missile

this dense volley is enough to cripple entire bomber waves and disperse fighter screens. Upon reaching a target, the missile will make attack rolls against that target and up to three others within Adjacent range.

Fragmentation missiles are also an effective counter to other missiles when targeted at another missile salvo, reducing the number of missiles within the salvo on a one-for-one basis. They have no effect on torpedoes.

ION MISSILE

An expensive but effective solution to the problem of disabling enemy ships for salvage, ion warheads operate as described on page 30 including the Effect rules that enable detonations to last multiple rounds. Successful attacks reduce the Power of opposing ships by 2Dx5 x the Effect of the attack. The Effect is also used to determine how many rounds the Power reduction lasts.

JUMPBREAKER MISSILE

These missiles create localised gravitational distortions when they detonate, making the delicate calculations required for an accurate jump much more difficult. A ship hit by a jumpbreaker missile suffers DM-8 to any Jump check (see the *Traveller Core Rulebook*, page 157) attempted in this combat round or the next.

LONG-RANGE MISSILE

This missile forgoes a large warhead, instead using the space for greater fuel capacity and a more powerful motor. Long-range missiles do not reduce their salvo strength every five rounds.

MISSILE FLIGHT TIMES

High Guard introduces several new types of missiles and torpedoes that have different Thrust ratings compared with the standard warheads of the *Traveller Core Rulebook*. This Missile Flight Times table helps Referees gauge how long it takes for salvoes to reach their target.

In addition, when huge salvoes of missiles are in-flight, problems with guidance and motor systems can become more apparent. Halve the number of missiles within a salvo for every full five rounds of travel. Torpedoes have much greater endurance and ignore this rule.

Missile Flight Times

Range	Thrust 6	Thrust 10	Thrust 12	Thrust 15
Short and Below	Immediate	Immediate	Immediate	Immediate
Medium	1	Immediate	Immediate	Immediate
Long	4	1	Immediate	Immediate
Very Long	6	4	3	2
Distant	21	10	9	7

MULTI-WARHEAD MISSILE

This heavy missile carries multiple warheads, which detach before impact. This both overwhelms anti-missile defences (DM-2 to all point defence fire) and causes more damage. Just before you make an attack roll, multiply the number or missiles in the salvo by three.

NUCLEAR MISSILE

A powerful missile available at lower Tech Levels, using nuclear missiles near an inhabited planet or orbit is forbidden by interstellar law. Nuclear missiles inflict more damage than standard or advanced missiles and also have the Radiation trait.

ORTILLERY MISSILE

Specifically designed for planetary bombardment, ortillery missiles are powerful but too slow to be used effectively as anti-ship weapons unless the target is not expecting an attack. See the Orbital Bombardment and Orbital Strike trait descriptions on page 30 for more information.

SHOCKWAVE MISSILE

This is a highly specialised missile that carries a magnetic-pulse warhead. The blast it creates is harmless to spacecraft but scatters and polarises sand clouds, rendering them useless in defence. A ship struck by a shockwave missile cannot benefit from sand defences for this round and the next.

STANDARD MISSILE

The most common form of missile, which carries a powerful explosive warhead.

SANDCASTERS

Most sandcasters fire canisters of small particles that counteract laser, energy and particle weapons fire but other types of canister are available. Additional canisters may be purchased for a ship, increasing its stock of ammunition. Twenty sand canisters consume one ton.

ANTI-PERSONNEL

This canister type launches multiple fragmentation charges that detonate a pre-set distance from the target, creating a hail of small fragments that inflict 3D damage (Ground scale) in a cloud around the targeted ship. Anti-personnel canisters can be used against targets in space or on a planetary surface.

CHAFF CANISTER

Sandcaster chaff disrupts sensors and communications targeted at the ship that creates the cloud. All Electronics (comms), Electronics (sensors), Electronics (remote ops) checks and attack rolls for missiles made within a chaff cloud suffer DM-1. Chaff does not provide protection against laser, energy or particle weapons.

PEBBLE CANISTER

This is designed as a basic offensive round for a sandcaster. When targeting boarders, pebble canisters cause 1DD damage (Ground scale). They do not provide protection against laser, energy or particle weapons.

SAND CANISTER

The standard canister fitted to most casters. Its use is covered in the *Traveller Core Rulebook*, page 168.

SANDCUTTER CANISTER

A very short-ranged weapon, the sandcutter fires a hail of electromagnets into the midst of an enemy sand cloud. These magnets cause the sand to coagulate, reducing its effective protection. A sandcutter canister may be targeted against an enemy ship within Adjacent or Close range and a successful attack halves the protection given by any sand canisters the enemy uses that round. It provides no protection laser, energy or particle weapons.

TORPEDOES

There are several different types of torpedoes beyond the standard warheads supplied with most weapon systems.

Additional torpedoes may be purchased for a ship, increasing its stock of ammunition, and torpedoes can be replenished after use. Three torpedoes consume one ton. The listed cost is for three torpedoes.

Canisters

Weapon	TL	Number	Cost	Traits
Anti-Personnel	8	20	Cr40000	—
Chaff Canister	8	20	Cr30000	—
Pebble Canister	7	20	Cr25000	—
Sand Canister	7	20	Cr25000	—
Sandcutter Canister	8	20	Cr35000	—

Torpedoes are much larger and more resilient than missiles, allowing them to punch through point defences to reach their targets.

A torpedo salvo halves the Effect of any successful point defence taken against it, rounding down. However, torpedoes are designed to target larger vessels and can have trouble making successful attacks against smaller ships. Torpedo salvoes suffer an additional DM-2 on their attack rolls against ships smaller than 2,000 tons.

ADVANCED TORPEDO

Manufactured with a more efficient warhead and far more powerful propulsion system, the advanced torpedo is the weapon of choice for high-technology fleets.

ANTIMATTER TORPEDO

Tipped with an antimatter warhead, this torpedo is immensely powerful, devastating to both ship and crew.

ANTIMATTER BOMB-PUMPED TORPEDO

This torpedo contains a small antimatter device that is detonated prior to impact, charging a directed particle beam. Due to the 'stand-off' nature of its attack, point defence against this torpedo suffers DM-2. Defences that work against particle beams – such as armour – can be used against this torpedo.

ANTIRADIATION TORPEDO

A cunning weapon, the antiradiation torpedo is designed to home in on the emissions used in electronic warfare. This gives the target a stark choice; continue performing electronic warfare and be hit by the torpedo or shut down all such activities and be hit by a potentially nastier missile attack. Antiradiation torpedoes can only make an attack roll against a ship if it performed electronic warfare in the current or previous combat round. However, it makes the attack roll with DM+6. If the ship did not perform electronic warfare, the torpedo automatically misses.

BOMB-PUMPED TORPEDO

This torpedo contains a small nuclear device that is detonated prior to impact in order to charge a laser. Due to the 'stand-off' nature of its attack, point defence against this torpedo suffers DM-2. Defences that work against lasers can be used against this torpedo.

ION TORPEDO

An expensive but effective solution to the problem of disabling enemy ships for salvage, ion warheads operate as described in New Trait: Ion on page 30 including the Effect rules that enable detonations to last multiple rounds. Successful attacks reduce the Power of opposing ships by 4Dx10 x the Effect of the attack. The Effect is also used to determine how many rounds the Power reduction lasts.

MULTI-WARHEAD TORPEDO

These heavy torpedoes carry multiple warheads that detach before impact. This both overwhelms anti-missile defences (DM-2 to all point defence fire) and causes more damage. Just before making an attack roll, multiply the number or torpedoes in the salvo by three.

Torpedoes

Weapon	TL	Thrust	Damage	Cost Per 3 Torpedo	Traits
Advanced	14	15	7D	Cr450000	Smart
Antimatter	20	10	3DD	Cr900000	Radiation, Smart
Antimatter Bomb-Pumped	21	10	8D	Cr800000	AP 10, Radiation, Smart
Antiradiation	12	10	6D	Cr300000	Smart
Bomb-Pumped	9	10	4D	Cr250000	Smart
Ion	9	10	Special	Cr230000	Smart
Multi-Warhead Antimatter	21	10	1DD	MCr2	Radiation, Smart
Multi-Warhead Standard	8	10	4D	Cr400000	Smart
Multi-Warhead Nuclear	8	10	6D	Cr600000	Radiation, Smart
Nuclear	7	10	2DD	Cr225000	Radiation, Smart
Ortillery	8	6	3DD	MCr1	Orbital Strike
Plasma	12	10	1DD	Cr650000	AP 10, Smart
Standard	7	10	6D	Cr150000	Smart

NUCLEAR TORPEDO

A basic but powerful weapon, the nuclear torpedo is used by lower tech navies.

ORTILLERY TORPEDO

Like its smaller missile counterpart, this torpedo is designed to be launched from orbit against planetside targets. Like their missile counterparts, ortillery torpedoes are too slow to be used effectively as anti-ship weapons unless the target is not expecting an attack. See the Orbital Bombardment and Orbital Strike trait descriptions on page 30 for more information.

PLASMA TORPEDO

This weapon is fitted with a powerful plasma burner in the nose and is particularly effective at cutting through ship armour.

STANDARD TORPEDO

This torpedo consists of a small but powerful propulsion unit, guidance computers and a fragmentation device dedicated to kinetic-kill attacks.

SMALLER WEAPONS

It is possible to equip a spacecraft with Ground scale weaponry. This is usually done on small craft designed to operate regularly within an atmosphere while engaging ground targets but any spacecraft can use them.

Weapons of up to 250 kilograms may be mounted on spacecraft using 0.25 tons per weapon. They are attached to fixed mounts on any spacecraft of less than 50 tons adding Cr5000 to the cost of each weapon, or small pop-up turrets operated from a remote station on larger ships at an added cost of Cr50000 per weapon. Either way, these weapons draw no Power from the spacecraft since it is assumed their energy requirements are tiny in comparison to other systems, and they consume neither hardpoints nor firmpoints.

Small weapons with a mass of more than 250 kilograms consume an amount of space equal to their mass, to a minimum of one ton. These must be mounted in turrets (if they mass one ton or less) or fixed mounts and consume no Power.

POINT-DEFENCE WEAPONS

A point-defence laser battery consists of linked short-ranged laser turrets controlled by their own automated computer. This removes the need for separate gunners dedicated to point defence, needing only a command from the bridge to activate when an incoming attack is detected.

A point-defence battery automatically intercepts missile and torpedo salvoes just before they make their own attack rolls. A point-defence battery reduces the number of missiles attacking a ship each turn by its Intercept score. This can be applied to any salvo or spread between several salvoes. A point defence battery uses 1 Hardpoint.

Point Defence Laser Batteries

Weapon	TL	Intercept	Power	Tons	Cost
Type I	10	+2D	10	20	MCr5
Type II	12	+4D	20	20	MCr10
Type III	14	+6D	30	20	MCr20

Point-defence gauss batteries are also available but primarily serve as a defence against torpedo attacks. They provide equal protection against missiles and torpedoes with a Thrust of 10 or less but suffer DM-2 against those with Thrust 12–14 and DM-6 against those with Thrust 15 or higher. Point-defence gauss batteries require less power than their laser counterparts but they do require ammunition storage. Much like sandcasters, each gauss battery may be fired for 12 rounds before requiring a reload. Each cannister of ammunition consumes one ton of space, costs Cr30000 and provides an additional 12 rounds.

Point Defence Gauss Batteries

Weapon	TL	Intercept	Power	Tons	Cost
Type I	10	+2D	5	20	MCr3
Type II	12	+4D	15	20	MCr6
Type III	14	+6D	25	20	MCr10

SCREENS

Screens are a variety of directed defensive systems that use various technologies to defeat specific attacks. For example, meson screens prevent meson decay and so are targeted against meson weapon attacks, while nuclear dampers are used against nuclear warheads.

Screens use the Gunner (screen) skill and the Angle Screens reaction against specific attacks, in a similar way to the Point Defence and Disperse Sand reactions in the *Traveller Core Rulebook*.

ANGLE SCREENS (GUNNER)

Using a screen, a gunner can attempt to deflect or reduce damage from incoming attacks. The gunner must succeed at a Gunner (screen) check against an attack and, if successful, reduces the damage of the attack – after armour has been accounted for – by the number of dice rolled by the screen (as noted in its description), multiplied by the Effect of the gunner's check.

A gunner may use any number of screens against a single attack, combining their dice (but only multiplying the result by the Effect once). A gunner may only attempt to Angle Screens once per round and each screen can only be used once.

SHIELDS

Many universes feature ships capable of generating shields that deflect or absorb damage. These are covered in the Exotic Technology chapter (page 79).

MESON SCREEN

Meson screens block attacks from meson weapons by preventing meson decay. A successful use of a meson screen reduces the damage of a meson weapon by 2D x 10 and removes its Radiation trait. When used to ward off a single attack, screens are grouped in batteries, requiring only a single Gunner (screens) check for an unlimited number of screens.

NUCLEAR DAMPER

Nuclear dampers project a series of nodes and antinodes where the strong nuclear force is enhanced or degraded, rendering nuclear warheads ineffective. A successful use of a nuclear damper against a fusion weapon or salvo of nuclear warheads (whether they are on missiles or torpedoes) reduces its damage by 2D and removes the Radiation trait. Against Destructive weapons, every five nuclear dampers reduce damage by 1DD and remove the Radiation trait.

Screens

Screen	TL	Power	Tons	Cost
Meson Screen	13	30	10	MCr20
Nuclear Damper	12	20	10	MCr10

BLACK GLOBE GENERATOR

Black globe generators are a special type of screen that projects an energy-absorbing barrier that shunts the energy of an incoming attack into capacitors. Any ship using a black globe generator cannot manoeuvre, dodge, jump or use weapons or sensors while the globe is active. *All* energy aimed at a ship with an active black globe generator is automatically absorbed, regardless of its type.

Black Globe generators are only available at TL15 or above and are not commercially available, tending to be either recovered artefacts of the Ancients or exotic (and not necessarily reliable) prototypes. They are installed either as makeshift defences or experimental screens on capital warships. These generators are therefore the jealously guarded property of governments and empires, and cannot be bought on the open market. The Referee always has final discretion on the availability of black globe generators.

Black globe generators consume 50 tons and, when available, cost at least MCr100. They require 30 points of Power.

ABSORBING ATTACKS

As the energy of attacks absorbed by the generator is channelled to capacitors, a ship must have sufficient capacity if it is to avoid overloading its systems and explode catastrophically. Fortunately, if a ship possesses a jump drive, it therefore has a considerable number of capacitors.

A jump drive has capacitors equal to 20% of its size in tons. Additional capacitors can be purchased at a cost of MCr3 per ton.

Each ton of capacitors absorbs 50 points of damage. After a hit is scored, roll damage and apply any Damage Multiple before determining how much damage is absorbed

DISCHARGING CAPACITORS

If a ship with a black globe generator absorbs more damage than its capacitors can handle, the ship automatically explodes, destroying it instantly.

To avoid this, the capacitors can be discharged. For every combat round the black globe generator is switched off, the capacitors discharge an amount of damage equal to 1% of the ship's total tonnage multiplied by 10% of the tonnage of the ship's power plant.

FLICKERING GENERATORS

A black globe generator that is switched on all the time automatically absorbs all incoming attacks. It also makes the ship it is protecting effectively invisible to sensors (since it absorbs all energy, not just that from weapons). However, the ship is unable to manoeuvre in any fashion, cannot make any attacks of its own, nor use its own sensors, rendering it blind.

Note that switching on a black globe generator in battle does not guarantee the ship can automatically escape its enemies. Since it cannot manoeuvre at all, it is a simple task to project its vector and predict its position when the generator is switched off again, making it extremely vulnerable (DM+2 to any attacks made against it if its vector was tracked).

These considerable limitations can be offset by causing the generator to flicker (switching the field off and on hundreds of times per second) to give the ship intermittent protection while allowing manoeuvring, sensor use and so forth, to take place in the short periods when the globe is switched off.

The flicker rate is variable and shown on the Black Globe Flicker table.

Black Globe Flicker

Flicker Rate	Attacks	Thrust	Sensor DM
1	6+	-1	-1
2	5+	-2	-2
3	4+	-3	-3
4	3+	-4	-4
5	2+	-5	-5
6 (always on)	—	—	—

The flicker rate is determined at the start of a ship's Manoeuvre Step in a combat round, before any Thrust is applied.

Every time the ship is attacked, roll 1D. If the dice roll is equal to or more than the score listed in the Attacks column for the flicker rate, then the attack is absorbed by the generator. If it is less, the attack hits the ship as normal.

The ship's available Thrust for that combat round is reduced by the Thrust modifier for the flicker rate and all sensor-related checks made by or against the ship suffer a negative DM indicated on the Black Globe Flicker table. The Sensor DM is also applied to all attack rolls made by the ship using the generator, as it has far less time to plot accurate attacks.

SPACECRAFT OPTIONS

Beyond the basic drives, sensors and weapon systems, spacecraft can be customised to perform specialised functions in many different ways, giving rise to an unlimited amount of variation. These optional systems are covered in this chapter. While they should be considered during the design of a spacecraft, most can be retrofitted to existing designs by any capable shipyard of sufficient Tech Level.

While most options can be accommodated by any shipyard capable of building or repairing spacecraft, some require far more advanced technology, as denoted by any TL requirement.

STRUCTURE

These options alter the basic framework of the ship and although they can be retrofitted, expect a ship to spend a considerable amount of time in a shipyard for installation.

ARMOURED BULKHEAD

Armoured bulkheads protect specific areas and systems, such as the jump drive or fuel tanks, making them much more resilient to damage.

Adding armoured bulkheads consumes an amount of space equal to 10% of the tonnage of the protected item. During space combat, the Severity of any critical hit to the protected space is reduced by -1 (to a minimum of Severity 1).

Option	Cost
Armoured Bulkhead	MCr0.2 per ton

ADJUSTABLE HULL

Large sections of the hull consist of bands and strips that change the hull's overall shape, making the ship have the same outline as any other ship of the same tonnage, hull configuration, hull options and external systems, including mimicry of attached modules, although these are non-functional. Other identification features such as the pattern of reactor and drive emissions can likewise be adjusted to enhance the deception. At the Referee's option, this may be limited to ships of the same general shape: a long and thin ship cannot mimic a box-shaped ship and vice versa. Reconfiguration takes one space combat round, during which the ship cannot fire weapons, dock or launch other ships or operate sensors. Any sensor close enough to achieve Full detail can see through the disguise but by then the ship is well within weapons range. The primary users of this hull option are pirates and Q-ships that want to pretend to be something else. This is also useful when landing in cargo or docking bays of unusual shape or size. All weapons, not just turrets, on such a ship have pop-up mountings at no additional cost.

Option	TL	Tons	Cost
Adjustable Hull	12	5% ship tonnage	+10% base hull cost
Adjustable Hull	15	1% ship tonnage	+100% base hull cost

PRESSURE HULL

Intended primarily for gas giant research vessels, a pressure hull is designed to withstand incredibly high pressures. Components within the pressure hull are protected from damage, as is the hull itself, to a far greater depth than normal when skimming fuel.

If the gas giant operations rules from the *Traveller Companion* are being used, the ship suffers no ill effects when operating in the Extreme Deeps zone. If the vessel enters the Depths zone, it will be unharmed for 2D hours, after which the pressure hull will begin to fail on a roll of 8+ on 2D, made every 1D hours. Once the pressure hull begins to fail, the ship takes normal damage (2D per round) and the pressure hull will need extensive repair work if the ship survives. If these rules are not used, assume the ship can descend to a level in a gas giant that makes it undetectable to ships in orbit. A vessel with a pressure hull can also operate at depths of 50 kilometres underwater; far deeper than the oceans of most worlds.

A pressure hull consumes 25% of the vessel's tonnage and costs 10 times the normal hull cost. It is considered to have intrinsic Armour +4.

MODULAR HULL

A portion of a ship's hull may be designated as modular, allowing it to be swapped out easily for another module. This allows a ship to be configured for specific missions and roles. For example, a modular ship may have modules for missile bays (making it a missile carrier), laboratories (to act as a research vessel) or hangar space (allowing it to transport smaller ships). The practice of using modules is more common among small craft but there is no theoretical maximum size to the ship that can use them.

Up to 75% of a ship's internal tonnage can be designated as modular. This tonnage cannot include the bridge, power plant, drives or any structure or armour options. Calculate Firmpoints or Hardpoints separately for the main hull and any module but the total cannot exceed the total number that would be allowed for a non-modular ship.

Making a modular hull increases the cost of the overall hull by the percentage designated as being modular. For example, a 100-ton hull normally costs MCr2. If 30% of the ship's hull is to be made modular, then the cost of the hull is increased to MCr2.6, which is 130% of the original cost. This results in 30 tons of the ship's components being easily swapped out from mission-to-mission.

MODULE

Hull modules are cheaper to build than regular hulls because they are not designed to operate as independent spacecraft. Options may be added to hull modules as normal.

Option	Cost
Module	Cr25000 per ton

POWER

A variety of options can be applied to a ship's power systems, normally for emergency use.

EMERGENCY POWER SYSTEM

An emergency power system allows a ship to keep functioning even when its main power plant has been taken completely offline and is a cheaper alternative than a second backup power plant.

If the main power plant sustains a critical hit of Severity 3 or greater, the emergency power system automatically activates and allows the ship to function normally for five rounds with 90% of its normal Power. If the power plant sustains a critical hit of Severity 6, the emergency power is taken offline as well.

Option	Tons	Cost
Emergency Power System	10% of power plant tons	10% of power plant cost

HIGH-EFFICIENCY BATTERIES

Ship-board batteries are designed to store power until needed. They can be recharged in any round with excess Power not being used by other systems. This Power can then be used in subsequent rounds as if they were being produced by the power plant; simply add the amount of Power stored within the batteries (they need not be completely drained) to the Power the ship has available that round.

High-efficiency batteries can be combined with secondary power systems, such as solar energy systems, to help keep them charged.

Option	TL	Cost per Ton	Power per Ton
High-Efficiency Batteries	10	MCr0.1	40
High-Efficiency Batteries	12	MCr0.2	60

SOLAR ENERGY SYSTEMS

There are two types of solar energy systems used by spacecraft: solar coatings and solar panels. Solar coatings integrate photovoltaic cells into individual hull panels, providing passive energy whenever a spacecraft is within range of a star. Solar panels are extendible energy-collection arrays that can provide more power at a sacrifice of mobility and tonnage.

Neither technology generates enough energy to provide for all the needs of most spacecraft but can be used to provide backup power for critical systems or paired with high-efficiency batteries (described on page 44) to provide a ready source of energy.

For solar coatings, Units indicate the percentage of the hull covered, limited to a maximum of 40% of the hull. Therefore, a 200-ton ship can have a maximum of 80 units. This limitation results from the fact that there are joints, grooves and other hull structures that cannot be coated. Solar coatings cannot be combined with most other hull options, with radiation shielding being the sole exception. Solar coatings consume no tonnage.

Solar Energy Systems

Type	TL	Power per Unit of Solar Coating	Power per Unit of Solar Panels	Cost per Unit
Basic	6	—	0.25	MCr0.1
Improved	8	—	0.5	MCr0.2
Enhanced	10	0.1	1	MCr0.3
Advanced	12	0.2	2	MCr0.4

Solar coatings are typically only applied to standard and sphere hull configurations, and only on ships that are not expected to enter an atmosphere. Coatings applied to close-structure and dispersed hulls produce 50% less energy because their surfaces have extensive areas that are obscured from view, thus making it difficult for them to extract power from a star. Coatings are not applied to streamlined hulls since the stresses of atmospheric re-entry renders them inoperable. Repairs to coated hulls are expensive, costing twice the amount listed in the *Traveller Core Rulebook* section on Repairs on page 159.

For solar panels, Units indicate the tonnage required for the system. For example, a 10-unit system consumes 10 tons of space. Solar panels only provide energy when they are deployed. Deployment requires one space-combat turn (six minutes). The ship cannot accelerate during deployment or when the panels are extended without doing critical damage to the array.

Solar energy systems store a very limited amount of energy. A system that is cut off from its source of solar energy only provides power for one additional turn.

Ships with solar energy systems have certain limitations because they must be near a star to work. Ships operating within the habitable zone or closer to a star receive the full listed power per installed Unit. For every band of orbital distance that the ship travels into the outer system of a star, they lose one half of their Power output, rounding down. For example, in a star system where the habitable zone is in the third orbital band of the star, a solar energy system that generates 10 Power has its output cut to 5 in the fourth band, 2 in the fifth band and so on. In addition, any time the system's collectors are blocked by an object – for example, a planet, moon or planetoid – they stop collecting energy and cease to provide power after one turn.

When deployed, solar panels nullify stealth and both types of solar energy systems make spacecraft easier to detect with sensors. Attempts to detect a ship with a solar coating receive DM+1 (DM+2 for solar panels but only when they are deployed).

DRIVES

Drives can be modified or given accessories to extend their utility or capability.

HIGH-BURN THRUSTER

A high-burn thruster is an auxiliary chemical rocket designed to give a temporary speed boost to a ship. This is done by adding a reaction drive whose Thrust is cumulative with that of the ship's regular drive system. A reaction drive used as a high-burn thruster should require far less fuel than a ship that uses reaction drives as its main source of thrust because typical applications are designed to provide thrust for a limited amount of time. For example, high-burn thrusters might be used to reach jump point faster, run a blockade or elude pursuers.

Note that high-burn thrusters do not include inertial compensation for a higher thrust rating than that of a ship's manoeuvre drive. Therefore, Travellers in a ship that is accelerating with a high-burn thruster are subject to the effects of its gravitational force equivalent, also known as G-force.

CONCEALED MANOEUVRE DRIVE

Manoeuvre drives, whose function is described in *Ship Design* on page 15, use thruster plates to move a ship without the need for propellant. Manoeuvre drive thruster plates are typically located on the outer surface of a ship (facing aft is standard) where they can perform best. While acceleration to their facing is optimised, a ship may accelerate in other directions at reduced thrust without turning the ship to a new facing. For example, thruster plates can accelerate a ship at up to 25% of their maximum thrust to port or starboard and 10% to fore. Therefore, a ship with Thrust 4 could exert one G of thrust to left or right and 0.4G to fore without the need to turn the ship on its axis.

As such, thruster plates need not be exposed at all and can optionally be concealed behind bulkheads. This rather severely degrades performance but there are some ship designs that are willing to accept the trade-offs for added stealth. See the *Sensors* chapter on page 55 for more information about features that make a ship easier to detect, including the use of their manoeuvre drives.

Concealed manoeuvre drives are contained within ship bulkheads but must be within three metres of the accelerating surface of the ship. Concealed manoeuvre drives add 25% to the tonnage and cost of the drive. The additional tonnage comprises a system that contains and exhausts thruster plate ionisation out of specially designed ports, reducing their detectability to almost nil. Concealed manoeuvre drives cut performance in half (round down), so a ship with Thrust

G-LOC

Accelerating at high g-force without the benefit of gravitic compensation can adversely affect a ship's crew. As thrust is increased, high g-forces can cause degraded performance, unconsciousness and even death. Suffering unconsciousness from exposure to high g-force is called g-induced loss of consciousness (or g-LOC). This phenomenon occurs at various g-forces, starting as low as three or four g for many people.

Most Travellers can sustain forces of two or three g for extended periods of time without losing consciousness. However, training and equipment is a big factor. Travellers who have the Pilot or Flyer skill are trained to deal with high g-forces. Equipment includes g-suits and drugs that mitigate the effects, both of which may be found in the *Central Supply Catalogue*.

Consult the g-LOC table for the effects of various g-forces on Travellers, which includes performance degradation and loss of consciousness. Travellers must make END checks to avoid suffering the negative effects of high-g, receiving DM+1 if they remain seated in an acceleration seat or similar assistive furniture for the duration of the increment. Increments are per hour, per space combat turn (six minutes) or per minute. For the effects of g-LOC, refer to Unconsciousness on page 83 of the *Traveller Core Rulebook*; however, Travellers are allowed to make one check to regain consciousness every D3 rounds instead of once per minute.

Maintaining operation of a vehicle at seven or more g without losing consciousness is extremely difficult, although fit, trained and well-equipped flyers have been known to sustain consciousness for extended periods of time. Being exposed to g-forces of 10+ without the benefits of training, equipment and perhaps anti-g drugs is deadly after a very short period of time. Exposure to g-forces this high fall into the realm of Referee fiat. If it serves the story and the Traveller is equipped to deal with high g-forces, allow them to sustain consciousness (or remain alive) for an appropriate period of time.

G-LOC

G-Force	Difficulty	Increment	Result
1	Automatic	—	—
2	Easy (4+)	Once per space combat turn	Travellers with Pilot or Flyer 0+ skill succeed automatically. Failure results in DM-1 to all tasks until g-force is reduced to no more than one for at least one hour.
3	Routine (6+)	Once per space combat turn	Travellers with Pilot or Flyer 1+ succeed automatically. Success indicates that consciousness is maintained but all tasks incur DM-1. Failure results in DM-2 to all tasks until g-force is reduced to no more than one for at least one hour. Exceptional Failure results in g-LOC.
4	Average (8+)	Once per space combat turn	Travellers with Pilot or Flyer 1+ gain their skill level as a positive DM. Success indicates consciousness is maintained but all tasks incur DM-1. Failure results in g-LOC and DM-2 to all tasks after returning to consciousness until g-force is reduced to no more than one for at least one hour.
5–6	Difficult (10+)	Once per minute.	Travellers with Pilot or Flyer 1+ gain their skill level as a positive DM. Success indicates consciousness is maintained but all tasks incur DM-2. Failure results in g-LOC and DM-2 to all tasks after returning to consciousness until g-force is reduced to no more than one for at least one hour.
7–10	Very Difficult (12+)	Once per minute.	Travellers with Pilot or Flyer 1+ gain their skill level as a positive DM. Success indicates consciousness is maintained but all tasks incur DM-2. Failure results in g-LOC and DM-2 to all tasks after returning to consciousness until g-force is reduced to no more than one for at least one hour.
11–15	Very Difficult (12+) Trained only (Pilot or Flyer skill)	Once per minute.	Travellers with Pilot or Flyer 1+ gain their skill level as a positive DM. Success indicates consciousness is maintained but all tasks incur DM-3. Failure results in g-LOC and DM-4 to all tasks after returning to consciousness until g-force is reduced to no more than one for at least one hour. Traveller loses END -1 permanently.
16+	Special (see below)	—	Varies. Loss of END -1 and INT -1 permanently if no anti-g drugs taken.

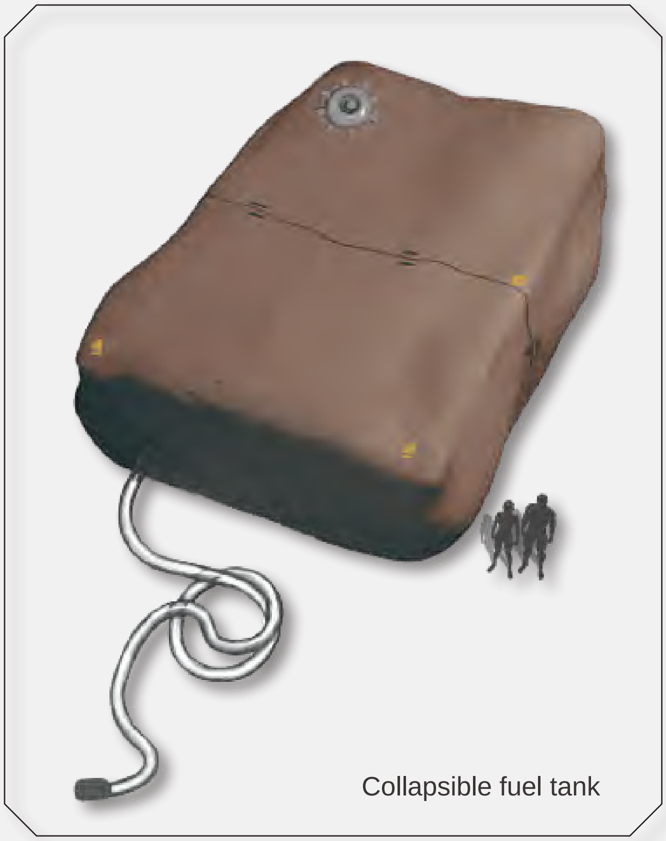
2 is reduced to 1 and so on. These drives are designed to operate within confinement, so simply removing the outer bulkhead does not add to their performance.

Option	Tons	Cost
Concealed Manoeuvre Drive	+25% of m-drive tons	+25% of m-drive cost

SOLAR SAIL

Solar sails are made of a flexible synthetic fabric that has limited self-repair capabilities. Particles emitted by the sun (the solar wind) are caught by the sail and provide a minuscule amount of thrust. Solar sails have the advantage that they require no power or reaction mass but result in very slow ships and high technology civilisations tend to regard them as useless for anything other than automated cargo ships and pleasure yachts. A deployed solar sail covers an area dozens of kilometres across. A ship using a solar sail as its primary method of propulsion has effective Thrust 0 and requires several days to change course or speed.

Jump drives cannot be engaged when a sail is deployed.



Collapsible fuel tank

Option	Tons	Cost
Solar Sail	5% of hull tonnage	MCr0.2 per ton

FUEL

Even humble fuel tanks are ripe for modification or addition, and a variety of systems have been developed to enhance the endurance and range of ships without the need to invest in much larger and more expensive drives.

COLLAPSIBLE FUEL TANK

Collapsible fuel tanks (also called fuel bladders) are large flexible bladders that expand when filled with liquid-hydrogen fuel. They take up cargo space in a ship and are used to extend range without the need to fit mountable or drop tanks. Fuel cannot be pumped directly from these tanks to the jump drive, so a ship must complete a jump before it can use fuel stored in collapsible tanks.

When empty, collapsible tanks consume 1% of the tonnage they use when full.

Option	Tons	Cost
Collapsible Fuel Tank	1% of tonnage used when full	Cr500 per ton

DROP TANK

Sometimes seen on military assault ships, these are external fuel tanks that are jettisoned just as the ship enters jumpspace. The virtue of a drop tank is that it allows a ship to carry a large amount of extra fuel but jettisoning a tank so close to a jump carries a risk. Jumping is a delicate procedure, greatly complicated by having big empty fuel tanks drifting close to the jump bubble.

Jump tanks come in two parts. Firstly, there are the docking ports, fuel injectors and explosive collars that allow the spacecraft to mount drop tanks and jettison them quickly. Secondly, there are the drop tanks themselves. A drop tank mount consumes a number of tons on board the ship equal to 0.4% of the tonnage of the drop tank itself (for the fittings needed to transfer fuel). The mount costs MCr0.5 per ton and the drop tank itself costs Cr25000 per ton of fuel space.

Jumping using a drop tank applies a penalty of DM-15 minus the Tech Level of the drop tanks to the Engineer (J-drive) check required to make a jump (see page 157 of the *Traveller Core Rulebook*).

When a drop tank is used and jettisoned, roll 2D. On 8+, the tank survives the ejection process and can, in theory, be retrieved and reused. Otherwise, it is destroyed by the expanding jump bubble or warped by the jettison explosion. In addition, drop tanks are automatically destroyed once their ship has lost 10% of its Hull points.

A ship's Thrust must be recalculated when carrying a drop tank, using the combined tonnage of the ship and the drop tanks it carries. This likely means the manoeuvre drive is operating at a lower Thrust. The jump capability of the ship does not need to be recalculated unless it jumps with the drop tanks attached. A ship using drop tanks cannot be streamlined – at best, it can be partially streamlined.

Option	Cost
Drop Tank Mount	MCr0.5 per ton

FUEL/CARGO CONTAINER
The downside of mountable and collapsible fuel tanks is the time required to swap between fuel and cargo carrying. In some configurations, tanks might block access to some parts of the ship – certain vessels use the cargo area as a thoroughfare, which can be a problem if it is full of liquid hydrogen.

Dedicated fuel/cargo containers present an alternative, allowing space to be switched between uses without a lengthy remodelling of the ship's interior. Containers can also be built in such a manner as to retain accessibility, including accessways, hatches and heavy-duty partitions that make them part of the ship rather than a component that must be added or removed as necessary. Swapping from fuel tankage to cargo space requires little more than flushing the tanks, then loading them with cargo as needed.

Containers of this sort are sometimes used aboard converted merchant craft to support other exploration ships by acting as tankers or long-range supply ships. They also increase the capabilities of an ordinary merchant, permitting extended transits between mains and clusters when necessary, yet retaining almost all capacity for day-to-day freight-transportation operations.

Each ton of capacity in a fuel/cargo container requires 0.05 tons of additional equipment and costs Cr5000 per ton of capacity. For example, a fuel/cargo container capable of carrying 100 tons consumes 105 tons and costs Cr500000.

Option	Cost
Fuel/Cargo Container	Cr5000 per ton of capacity

FUEL PROCESSOR
Fuel processors convert unrefined fuel (typically acquired via a fuel scoop) into refined fuel, making the ship both self-reliant and safe.

Each ton of fuel processor can convert 20 tons of unrefined fuel into refined fuel per day.

Option	Cost	Power
Fuel Processor	Cr50000 per ton	1 per ton

FUEL SCOOP
Fuel scoops allow unstreamlined and partially streamlined ships to gather unrefined fuel from a gas giant (streamlined ships have fuel scoops built-in automatically at no additional cost).

Adding scoops costs MCr1 and consumes no tonnage.

FUEL TANK COMPARTMENTS
These are containers designed to float within the hydrogen fuel tanks of a ship and are harder than concealed compartments to detect, as even a thorough examination of the ship does not detect the compartment unless the fuel tanks are opened and searched. Such compartments can only be accessed when the fuel tank is at least three-quarters empty.

A fuel tank compartment inflicts DM-4 to Electronics (sensors) checks and DM-6 to Investigate checks made to search for it.

Fuel tank compartments cost Cr4000 per ton. Note that the tonnage for these compartments is deducted from the ship's fuel tankage, not its total hull.

METAL HYDRIDE STORAGE
Instead of storing the ship's hydrogen fuel in liquid form at extremely low temperatures with a high risk of explosion if a leak occurs into the inhabited spaces of the ship, it is possible to store hydrogen at room temperature using a non-flammable metal hydride matrix. This takes up more space but is safer.

Metal hydride storage replaces a ship's normal fuel tankage but consumes twice as much space and costs MCr0.2 per ton.

If the ship sustains a fuel leak (fuel critical hit Severity 1–3, as shown on page 170 of the *Traveller Core Rulebook*), fuel loss is reduced to 25% of the amount indicated, to a minimum of one ton.

Option	TL	Cost
Metal Hydride Storage	9	MCr0.2 per ton of fuel

MOUNTABLE TANK

These tanks are used to convert cargo space into working fuel tanks with all the pumps and feed lines required. Fuel can be used directly from these tanks, enabling ships to make longer jumps than they would be able to on their own tanks (however, they are still limited by the capability of their jump drive). When empty, these tanks consume the same space as when they are full and cannot be used for anything but fuel.

It takes four weeks to add or remove mountable fuel tanks to a ship's cargo spaces.

Option	Cost
Mountable Tank	Cr1000 per ton

RAMSCOOPS

Ramscoops are passive hydrogen collectors that operate automatically whenever a starship is manoeuvring in normal (non-jump) space. Ramscoops require several weeks of continuous operation to obtain enough hydrogen to fill the tanks of a typical ship. The ship must be actively manoeuvring during this time, enabling the ramscoops to extract hydrogen from the interstellar medium. Ramscoop ships do not need fuel scoops, nor do they need fuel processors since the hydrogen is processed and purified as it is collected. The advantage of this technology is that it enables a starship to make as many jumps as desired without ever visiting a starport or gas giant for refuelling.

The typical configuration for ramscoops is an array of cylinders or similar structures outfitted on the exterior of a ship, co-located with its fuel tanks. Because of the bulkiness of the collectors, ships outfitted with ramscoops cannot perform atmospheric re-entry without damaging the ramscoops and are therefore rarely streamlined. If the ship is docked or otherwise immobile, ramscoops cease to function but will automatically resume operation once the ship starts manoeuvring again.

Ramscoops require 1% of a ship's available tonnage plus five tons, with a minimum overall size of 10 tons and can collect five tons of hydrogen per week for every ton attributed to the ramscoops. Additional tonnage may be added as desired. Ramscoops cost MCr0.25 per ton.

ACCOMMODATIONS

Most ships utilise the humble stateroom but other types of accommodation are available. All accommodations listed in this book other than low berths and acceleration benches and seats include a fresher while all staterooms and barracks include a small food preparation area. Laundry facilities are usually located in a common area.

ACCELERATION BENCH AND SEAT

These comprise basic seating used for the temporary transportation of passengers. Comfort is limited but safety remains paramount. The benches are heavily padded with integral safety harnesses in case of gravity failure. They are normally designed to fold down from walls or pull up from floors, to grant more usable space when not in use.

Similar to an acceleration bench, this seating is somewhat comfier although less space efficient. While not luxurious, it is commonly used on commercial small craft designed for short haul flights to and from orbit and flights to close satellites.

Option	Seats	Tons	Cost
Acceleration Bench	4	1	Cr10000
Acceleration Seat	1	0.5	Cr30000

BARRACKS

Ships designed to carry large numbers of troops tend to use barracks instead of staterooms. A barracks may only be used to carry soldiers, basic passengers or other personnel who will put up with cramped conditions. This includes marines, ship's troops or other military personnel who have no other function aboard the ship.

Option	Tons	Cost	Life Support Cost
Barracks	1 per passenger	Cr50000 per ton	Cr500 per ton

BRIG

This is a secure chamber with reinforced walls and a door that can be manually locked from the outside. Designed to hold up to six prisoners, it can uncomfortably hold double that number if necessary.

There are no internal facilities or controls, save for a curtained fresher and six pull-down slabs that can be used as beds. Although intended for restraining captives or crew held on a charge, a brig can double as a temporary office or storage area.

Option	Prisoners	Tons	Cost	Life Support Cost
Brig	6	4	MCr0.25	Cr1000

CABIN SPACE

Adding cabin space gives the crew more room to move around and to access other components of the ship, such as the engines or cargo bay. However, it does not provide comfortable living space and is generally only used in interplanetary craft where passengers are only expected to be on board for a few hours.

Every 1.5 tons dedicated to cabin space allows the ship to carry another passenger in moderate comfort.

Option	Cost	Life Support Cost
Cabin Space	Cr50000 per ton	Cr250 per ton

HIGH AND LUXURY STATEROOM

These are similar to the staterooms detailed on page 24 but are trimmed in finer materials and offer more space for the occupant. They are not required for a ship to take on high passengers but a high passenger will almost always choose a ship that has a high stateroom over one that does not. A high stateroom grants DM+1 when seeking high passengers (see page 238 of the *Traveller Core Rulebook*).

The Luxury Stateroom' is state of the art accommodation for the most discerning passenger. It is noticeably a step above even the high stateroom and more richly appointed, found on private yachts and the most luxurious liners. A luxury stateroom grants DM+2 when seeking high passengers (see page 149 of the *Traveller Core Rulebook*).

Option	Tons	Cost	Life Support Cost
High Stateroom	6	MCr0.8	Cr3000
Luxury Stateroom	10	MCr1.5	Cr5000

MULTI-ENVIRONMENT SPACE

The environment of this designated area can be modified to a wide range of conditions including salt water, extreme temperatures or unusual atmospheres, all to suit the needs of the occupant, usually an alien, animal or exotic plant.

Designating space as multi-environment has a negligible direct cost; the cost is in the necessary support equipment.

Option	Tons	Cost	Power
Multi-Environment Space	+5% to tonnage of multi-environment space	MCr0.5 per ton	1 per ton of environmental equipment

BRIDGE

The bridge is the nerve centre of the ship and vital to on-board operations. Some bridge designs put the captain and other command staff on a raised balcony or walkway over the workstations, while others put the captain in a command seat in the centre of the bridge. Bridges on scout ships are notoriously cramped and smelly – even more so in belter mining ships where the bridge and living space is sometimes combined to maximise cargo capacity – while some groups of free traders pride themselves on the elegance and style of their command stations.

DETACHABLE BRIDGE

This bridge design can be ejected from the ship in an emergency to become a lifeboat for the command crew. The bridge has two weeks of life support and battery power, while emergency thrusters give it basic manoeuvring capabilities, equivalent to Thrust 0. A detachable bridge is even capable of soft-landing on a planetary surface.

Size of Ship	Minimum Size
200 tons or less	15 tons
201–1,000 tons	30 tons
1,001–2,000 tons	50 tons
2,001 tons or more	80 tons

Making a bridge detachable adds +50% to its cost and consumes +20% more tonnage. If deck plans are created for a design with a detachable bridge, include a compact battery array and manoeuvre drives adjacent to the bridge.

HOLOGRAPHIC CONTROLS

This bridge design incorporates advanced interactive holographic displays and can be configured to automatically adapt to changing situations or personnel. A bridge with holographic controls is always optimised for the task at hand and grants DM+2 when rolling for initiative.

Holographic controls add +25% to the cost of the bridge and are available at TL9.

SENSOR STATION

While every bridge has equipment dedicated to monitoring and controlling the ship's sensors (even if this is tied to the pilot's display), some ships benefit from having additional stations to handle an increased number of sensor operators. Some scout and survey ships feature additional sensor stations, while military vessels might feature similar stations dedicated to locating the enemy and electronic warfare.

During space combat, sensor operators are often called upon to perform a number of tasks, including detecting enemy ships, obtaining sensor locks and performing electronic warfare. With only a single sensor station, the ship can only perform one of these tasks in a given round but each additional sensor station can perform a different task. For example, with two sensor stations, a ship can attempt to obtain a lock and perform electronic warfare in the same combat round.

Option	Tons	Cost
Sensor Station	1	MCr0.5

Note that sensor stations are options only on ships of 7,500 tons or less. Capital ships are assumed to have multiple sensor stations in their much larger bridges.

CARGO

The majority of ships in the universe are designed to haul cargo from one star system to another. Predictably, a whole host of optional systems and equipment have been designed to make this easier.

CARGO CRANE

Built into the ceiling of a cargo hold, this overhead gantry crane is designed to shift cargo containers in and out of the ship. The crane's mechanism moves about the bay on a sliding jig and can extend beyond the cargo door on a gibbet to deposit freight directly onto a dockside or vehicle. The crane is strong enough to lift fully loaded containers of up to 65 tons and can couple with most pallets and crates.

Option	Tons	Cost
Cargo Crane	2.5 + 0.5 per 150 tons (or part thereof) of cargo space	MCr1 per ton

CARGO NET

A slower but safer method than a scoop for retrieving cargo from space, the net consists of a mesh of tough plastic and several remotely controlled tow drones. The drones are launched from the ship, dragging the net out behind them. The net is drawn around a volume of space and then retracted.

The plastic is extremely elastic, allowing the volume of the net to be potentially increased to a dozen cubic kilometres. Note that a starship cannot jump with its cargo net extended.

Option	Tons	Cost
Cargo Net	5	MCr1

CARGO SCOOP

A cargo scoop allows a ship to pick up cargo or other objects floating in space. The scoop includes anti-gravity baffles to minimise the impact but using a scoop with a high relative velocity is not recommended.

A Pilot check is required to scoop up an object; if failed, the ship collides with the object, taking an amount of damage equal to the negative Effect. Armour negates this damage, so most accidents are embarrassing rather than catastrophic and merely require a little repainting. A scoop can sweep up one ton of material per round.

Option	Tons	Cost
Cargo Scoop	2	MCr0.5

EXTERNAL CARGO MOUNT

Instead of carrying cargo inside the hull, a ship can be designed to mount cargo in an external rack or framework. This allows a smaller hull to be used, making the cost of transportation considerably cheaper. Ships with streamlined or dispersed structure hull configurations cannot use external cargo mounts. A ship's Thrust and jump capability must be recalculated when using external cargo mounts, using the combined tonnage of the ship and the external cargo it carries. This likely means that the manoeuvre drive operates at a lower Thrust and jump capability is reduced.

Cargo carried externally can only be accessed outside the ship by vacc suit or vehicle. Landing a ship with external cargo mounts is a dangerous procedure, so these ships can have difficulties trading at worlds without a shuttle fleet or highport. Landing a ship requires a Difficult (10+) Pilot check. Failure results in a Critical Hit to the cargo contained in the mount, with each point of negative Effect causing one level of severity, as described in the Critical Hit Effect chart on page 170 of the *Traveller Core Rulebook*. For example, a failed check with two points of negative Effect results in 1D x 10% of cargo destroyed.

External cargo can be jettisoned remotely. The mount is equipped with explosive bolts, allowing specific cargo to be released if necessary. A ship using external cargo mounts becomes unstreamlined regardless of its default configuration.

The cost of an external cargo mount is Cr1000 for every ton of cargo.

JUMP NET

A jump net consists of special field cables attached to the rear of a ship that extend the vessel's jump field to include additional cargo contained within the net. While this can look exceedingly crude and makes the ship unstreamlined while in use, a great deal of engineering goes into making it work and it remains both cheap and effective.

A cheaper version designed purely for interplanetary use is available at TL8 but the ship cannot perform a jump while this net is deployed.

A ship using a jump net must have its drive potentials adjusted by adding the cargo carried to the ship's total hull mass. This will likely degrade the ship's Thrust and jump scores.

Option	TL	Tons	Cost
Interplanetary Jump Net	8	1 per 100 tons of cargo	MCr0.1 per ton
Interstellar Jump Net	10	1 per 100 tons of cargo	MCr0.3 per ton

LOADING BELT

Used to offload cargo from a hold, the loading belt does the work of 10 crewmen when used properly. From TL12, high-powered magnets are used to propel cargo containers, increasing the work output to that of 25 crewmen.

Option	TL	Tons	Cost	Power
Loading Belt	7	1	Cr3000	1
Loading Belt	12	1	Cr10000	1

SUPPLIES, SPARES AND STORES

Military capital ships maintain stores, spares and supplies necessary for the operation of the ship, measured in Supply Units (SU). Capital ships consume an amount of SU equal to their tonnage divided by 100 every day. Most ships contain enough supplies for 100 days. Each 100 SU contains one ton of supplies. For example, a 50,000-ton warship normally consumes 500 SU per day or five tons. The ship should therefore have a minimum of 500 tons of cargo space so that it can potentially store 100 days' worth of SUs.

While there is no direct requirement for ships to maintain a specific number of SUs, allowing supplies to run low has a deleterious effect on the operation of the ship and can negatively affect morale. Refer to the *Naval Campaigns Handbook* from the *Element Class Cruisers* box set for more information. When designing a military capital ship, note the Maximum Stores tonnage in the cargo section of the ship sheet. Ideally, the overall cargo tonnage of the ship should be equal to or greater than this amount.

DRONES

Drones are small robotic craft typically controlled from the bridge or a dedicated station. They are used as labour-saving devices and for tasks that might otherwise endanger the crew.

Drones are typically human-sized and have gravitic drives that allow them to operate in both space and atmospheres. However, while they can land on a planet, they do not have the power to travel from the surface to orbit and must be recovered manually. The Electronics (remote ops) skill is required for their use.

Each of the drones listed here are described in more detail in the *Robot Handbook* but basic descriptions are presented here.

MINING DRONES

Mining drones allow a ship to mine asteroids without manoeuvring perilously close to them. Each set of five mining drones allows the ship to process 5D tons of asteroid per day (typically producing common ore, as detailed on page 159 of the *Traveller Core Rulebook*). The tonnage consumed includes ore handling machinery, allowing the ship to take on ore and transfer it to the cargo bay.

Robot	Hits	Locomotion
Mining Drone	50	Thruster (0.1G)
Attacks	None	
Armour	+10	

Every 10 tons dedicated to mining drones contains five drones and costs MCr1.

Drone Type	TL	Quantity	Tons	Cost
Mining	12	5	10	MCr1

PROBE DRONES

Probe drones are for surveying planetary surfaces and are commonly found on board scout ships. They can be dropped from orbit in disposable entry shells but must be recovered manually. Probe drones are also capable of surveying orbiting satellites, derelicts and other space debris, and can also be used as communications relays. These drones can operate indefinitely using 10-year half-life orbital solar panels. A backup battery system provides power for up to 48 hours should the drone be blocked from access to solar energy.

The logical development of the probe drone, the advanced probe drone is of a similar size and carries more advanced sensors (TL12). These drones can operate indefinitely using 25-year half-life orbital solar panels. A backup battery system provides power for up to 72 hours should the drone be blocked from access to solar energy.

Drone Type	TL	Quantity	Tons	Cost
Probe	9	5	1	MCr0.5
Advanced Probe	12	5	1	MCr 0.8

REPAIR DRONES

Carrying repair drones allows a ship to make repairs during combat, allowing access to exterior components without risking crew.

Repair drones allow a Traveller with the Electronics (remote ops) skill to make an additional Repair System action (see page 159 of the *Traveller Core Rulebook*) during space combat. The repair drones are considered to have an Engineer skill level of 1 or the level the Traveller has in Electronics (remote ops), whichever is lower, in all specialities for the Repair System action alone.

A ship must dedicate 1% of its tonnage for effective repair drone coverage (minimum one ton), at a cost of MCr0.2 per ton.

Drone Type	TL	Quantity	Tons	Cost
Repair	10	Varies	1% of ship tonnage	MCr0.2 per ton

SENSORS

Many ships, especially larger and more expensive vessels, feature upgraded or specialised sensor suites. However, any sensor suite can be upgraded with a range of options to improve the likelihood and quality of acquired data and the range at which objects can be detected.

COUNTERMEASURES SUITE

A countermeasures suite (TL13) is designed to jam enemy transmissions. Note that meson transmissions cannot be jammed. The countermeasures suite grants DM+4 to all attempts at jamming and electronic warfare, regardless of the usual DM the sensor suite it is attached to.

A military countermeasures suite (TL15) is the cutting edge of countermeasures technology, incorporating powerful transmitters and advanced electronic-warfare programs to shut down enemy communications. The military countermeasures suite grants DM+6 for all jamming and electronic warfare attempts, regardless of the usual DM of the sensor suite it is attached to.

Option	TL	Tons	Cost	Power
Countermeasures Suite	13	2	MCr4	1
Military Countermeasures Suite	15	15	MCr28	2

DEEP PENETRATION SCANNERS

Using neural activity sensors (NAS) and densitometers configured to check every centimetre of a ship's internal and external hull, deep penetration scanners require a target to be within Adjacent range. They allow the operator to see everything within a ship that can be perceived visually such as layout, hidden spaces and the make-up of anything carried aboard the ship, including crew, cargo or personal effects. However, they are also very slow when scanning large ships unless the scanner suite is very large.

Each ton of deep penetration scanner allows for 20 tons of a target vessel to be scanned every hour (so, for example, a 25-ton suite can scan a 500-ton ship in an hour).

Option	TL	Cost	Power
Deep Penetration Scanners	13	MCr1 per ton	1

DISTRIBUTED ARRAY

By using multiple hull-mounted arrays in an integrated computer-controlled arrangement, it is possible to increase the effective antenna size and range of a sensor suite. EM and active radar/lidar can then detect objects at Distant range and passive radar/lidar at Long range. All information gained at these ranges is minimal (see page 160 of the *Traveller Core Rulebook*). This modification can only be added to Improved and Advanced sensor suites and only on ships of more than 5,000 tons.

Distributed arrays are available at TL11. Triple the tonnage, cost and power requirement of the sensor suite to which they are attached.

EXTENDED ARRAY

This is a distributed array that is extended well beyond the hull of the ship on retractable arms; there is no limit to the size of ship it can be mounted upon. However, use of an extended array greatly limits the manoeuvrability of the ship and increases its own sensor signature.

An extended array acts in the same way as a distributed array. While in use, the ship cannot expend any Thrust or jump and any attempts to detect it gain DM+2.

Extended arrays are available at TL11. They triple the tonnage and cost of the sensor suite to which they are attached and triple the Power requirement.

EXTENSION NET

The defence of space is reliant upon properly identifying ships and unidentified objects. A sensor extension net enhances the clarity of a sensor suite beyond its default range by using small drones to relay additional data to a central hub. Each drone is also a sensor platform in its own right, which transmits data to the control centre of the array via a network.

An extension net increases the range at which a sensor suite can normally obtain Limited or Full detail by a single step. For example, a visual sensor can normally see Full detail up to Short range and Limited detail up to Long range. With an extension net, this is increased to full detail up to Medium range and Limited detail up to Very Long range.

An extension net cannot be used with NAS or densitometers, nor can it be used to receive data if the ship that deployed it is manoeuvring.

Option	TL	Tons	Cost
Extension Net	10	1% ship tonnage (min. 1 ton)	MCr1 per ton

LIFE SCANNER

The life scanner is a ship-mounted sensor array specifically calibrated for detecting signs of life and differentiating between life forms. For example, it can differentiate between colonies of insects, herds of migrating animals and social groups of sentient creatures. Typically used in high orbit above a newly discovered planet, within 24 hours (for an average, earth-sized world) it can identify and quantify population densities, likely life types (sapient, sentient, non-sapient and so forth) and ecological niches.

When using the life scanner, an Electronics (sensors) check is required to successfully interpret the results. The life scanner is not 100% accurate; it typically has an accuracy of between 70% and 85% but this is sufficient for first-pass exploration needs.

The life scanner analysis suite is a more advanced version that does all of the things the lower tech model does but also takes atmospheric and environmental factors into account to develop an accurate portrait of the biology of life detected. For example, the system can indicate the physical configuration of detected life, approximate its food requirements and analyse additional critical data that informs the Travellers on how to prepare for direct encounters with the life form.

Option	TL	Tons	Cost	Power
Life Scanner	12	1	MCr2	1
Life Scanner Analysis Suite	14	1	MCr4	1

MAIL DISTRIBUTION ARRAY

Normal ship communications systems cannot handle the data loads necessary for dealing with mail on the scale that the x-boat network requires. Instead, most x-boats and similar ships mount specialised communications arrays that can handle the immense amount of data that must be transmitted.

Option	TL	Tons	Cost
Mail Distribution Array	10	10	MCr20
Mail Distribution Array	13	20	MCr10

MINERAL DETECTION SUITE

This suite upgrades sensor systems that include a densitometer, enabling them to determine types of minerals present and their quantities.

The mineral detection suite is available at TL12, consumes one ton and costs MCr5.

RAPID-DEPLOYMENT EXTENDED ARRAYS

This system works in the same way as an extended array but it can be deployed and retracted within a few seconds, allowing a ship to use its manoeuvre and jump drives within the same combat round.

Rapid-deployment extended arrays are available at TL11. They triple the tonnage of the sensor array to which they are attached, multiply its cost by five and triple its Power requirement.

SHALLOW PENETRATION SUITE

This is a combined thermal/EM sensor suite designed specifically for hull penetration and internal scanning at range.

At up to Very Long range, it allows a sensor operator to ensure there is nothing unusual aboard a vessel that leaves a thermal or electromagnetic trace. For example, it detects increased heat production where there should be none or the operation of fire control computers on an unarmed merchant.

Option	TL	Tons	Cost	Power
Shallow Penetration Suite	10	10	MCr5	1

SIGNAL PROCESSING SYSTEM

Signal processing systems consist of extremely specialised computers and software that improve the quality and likelihood of detection for sensor suites.

Improved signal processing grants DM+2 to all sensor-related checks. However, this comes at a cost of increased vulnerability to jamming, with other ships doubling all DMs they have for jamming a ship equipped with signal processing.

Enhanced signal processing grants DM+4 to all sensor-related checks. It does not have the vulnerability to jamming of the Improved Signal Processing option.

Option	TL	Tons	Cost	Power
Improved Signal Processing	11	1	MCr4	1
Enhanced Signal Processing	13	2	MCr8	2

EXTERNAL SYSTEMS

External systems are components and optional items mounted on the exterior of a spacecraft, directly on or within the skin of its hull.

AEROFINS

Extendible aerofins improve a spacecraft's manoeuvrability in atmosphere, giving a far greater degree of control over its movements.

A ship with aerofins deployed gains DM+2 to all Pilot checks when within an atmosphere.

Option	Tons	Cost
Aerofins	5% of ship tonnage	MCr0.1 per ton

BREACHING TUBE

All airlocks include flexible plastic docking tubes that allow passengers to cross from one ship to another by floating through the air-filled tube. A breaching tube is a military version of the airlock that may be forcibly applied to the hull of another ship. Instead of a thin myomer, the breaching tube is made of a combination of ballistic cloth and reflec. The breaching tube does not end in a docking collar but in a magnetic clamp with a ring of plasma torches that burn through the hull of an enemy vessel when attached.

Breaching tubes can only be attached to disabled or otherwise inert ships. If either ship moves after a breaching tube has been attached, the breaching tube is destroyed and the ship to which it is attached receives 2D damage. In addition, if the breaching tube plasma torches have been allowed to begin cutting through the hull, the ship to which they are attached might suffer an explosive decompression event. Refer to Atmosphere and Vacuum in the *Traveller Companion* for more information.

An attacking ship fitted with a breaching tube gains DM+1 to rolls made on the Boarding Actions table on page 175 of the *Traveller Core Rulebook*. For more advanced rules, see Boarding Actions on page 125 of this book.

Option	Tons	Cost
Breaching Tube	3	MCr3

DOCKING CLAMP

A docking clamp allows a spacecraft to carry another vessel on the exterior of its hull, typically a small craft such as a ship's boat or fighter. This permits a ship to carry auxiliary craft without consuming valuable interior space.

A ship's Thrust and jump capability must be recalculated when another ship occupies its docking clamp, using the combined tonnage of both ships. This likely means the manoeuvre drive will be operating at a lower Thrust and the jump capability is reduced.

The size of a docking clamp dictates the tonnage of the ship it may attach as shown in the Docking Clamp table. Docking clamps can be added to streamlined ships but the ship becomes unstreamlined when another ship is docked to it. Docking clamps alone do not affect a streamlined configuration. It takes three full rounds to release or clamp a ship of less than 2,000 tons, during which time neither ship can expand any Thrust or make any attack rolls. Larger ships take D3+3 rounds.

Note that ships held in a docking clamp can be targeted separately by an attacker. Any evasive action employed by the mothership can be applied as normal.

Docking Clamp	Attached Ship Tonnage	Tons	Cost
Type I	1–30	1	MCr0.5
Type II	31–99	5	MCr1
Type III	100–300	10	MCr2
Type IV	301–2,000	20	MCr4
Type V	2,001 or more	50	MCr8

FORCED LINKAGE APPARATUS

Used by naval patrol ships, scavengers and pirates to board spacecraft, forced linkage apparatuses are close-range grappling devices that allow attempts at forced docking. After a successful grapple, the ship can be boarded or towed into port at leisure. Grappling cables can be used to restrain a fleeing ship or stabilise a tumbling ship. The ship attempting forced linkage must have a Thrust advantage of at least one over the opposing ship and may not be less than half the tonnage of the target ship.

The use of Forced Linkage requires a task chain. First the attacking ship's pilot must position their ship for the linkage attempt. If the target ship is crewed and powered, make an opposed Pilot check (DEX or INT) against the pilot of the target ship. Each unused point of Thrust may be applied for DM+1. After the pilot of the attacking ship has won an opposed check, a gunner fires the grappling device: Average (8+) Gunner (turret) check (DEX), adding the Task Chain DM.

Option	TL	Pilot check DM	Tons	Cost
Basic	7	-2	2	Cr50000
Improved	9	-1	2	Cr75000
Enhanced	12	+0	2	MCr0.1
Advanced	15	+2	2	MCr0.5

At TL7 the apparatus is little more than a magnetic clamp on a retractable arm. At TL9 the linkages are gas-powered grapnels with a reeling cuff, while at TL12 the linkage is magnetically propelled and guided by targeting lasers. At TL15 the linkage is made of gravitic field control rods and antennae.

A forced linkage apparatus may be combined with a breaching tube. Note that forced linkage devices may only be used on ships of 5,000 tons or less.

GRAPPLING ARM

A grappling arm is a remotely controlled device used to pick up or manipulate objects in space. The arm is a flexible tentacle of thousands of telescoping segments, capable of reaching out to 250 metres. The arm ends in a set of cameras and grippers of varying sizes, from large claws to tiny micro-manipulators. It also carries a toolkit that can be customised for a particular task.

A grappling arm can manipulate objects of up to two tons. A heavy grappling arm can manipulate objects of up to 10 tons. Multiple grappling arms of either type can be used to move heavier objects.

Option	Tons	Cost
Grappling Arm	2	MCr1
Heavy Grappling Arm	6	MCr3

HOLOGRAPHIC HULL

Multiple holographic projectors are embedded within the hull allowing the ship to change hull colours, add graphics and adopt a different appearance (although its shape remains the same). Changing the hull colour or adding a stored graphic can be done by anyone with access to the ship's computer. Creating a complex colour scheme from scratch requires the talents of a skilled artist. Some young nobles try to outdo one another by changing the schemes daily or hiring artists to create the most complex scenes imaginable. Some pirates have made use of this system to simulate visual hull damage and lure other ships in with a Signal GK distress call. However, most ship owners use it for advertising. The projectors are small enough that they do not consume tonnage.

Option	TL	Cost	Power
Holographic Hull	10	Cr100000 per ton of hull	1 per 2 tons of hull

TOW CABLE

A simple device used to haul an attached derelict or unpowered ship behind the modified vessel. The ship can potentially tow any size vessel provided it has the Thrust to do so.

A ship's Thrust must be recalculated when it tows another ship or object, using the combined tonnage of both ships; therefore, the manoeuvre drive will be operating at a lower Thrust. A ship towing an object in this fashion cannot jump.

Option	Tons	Cost
Tow Cable	1% of ship tonnage	Cr5000 per ton

INTERNAL SYSTEMS

A wide variety of options and internal systems are available to customise a ship. This includes new rooms and facilities for the crew, as well as safety and security features.

ADDITIONAL AIRLOCK

A ship is assumed to have one airlock for every full 100 tons or part of. However, additional airlocks of any size may be added to a ship.

Airlocks consume a minimum of two tons and cost MCr0.1 per ton. Larger airlocks can be used for cargo bays.

ARMOURY

Ships carrying a large number of marines or soldiers can benefit from an armoury, a specialised weapons storage facility. An armoury can only be accessed by those with the correct codes (usually the ship's senior officers and security teams) and may contain a wide variety of weapons. An armoury can be equipped with specialised weaponry but, as standard, will have enough snub pistols for the entire crew, enough accelerator or gauss rifles for any marines and a selection of other military equipment such as grenades, combat drugs, armour and communications equipment.

One ton of armoury is required for every 25 crew members or five marines in order to provide adequate storage for equipment, weapons and ammunition.

Option	Tons	Cost
Armoury	1	MCr0.25

BIOSPHERE

This is an area dedicated to flora and fauna, either for the production of food or as a leisure area. Every ton dedicated to a biosphere eliminates life support costs for two passengers.

Biospheres consume one Power and cost MCr0.2 per ton.

BOOBY-TRAPPED AIRLOCK

An existing airlock can be fitted with lethal defensive equipment designed to eliminate any undesirable occupant who attempts to gain entry to the ship. The actual methods of dealing with enemies vary, ranging from nerve gas and flamethrowers to sweeping lasers and extreme atmospheric pressure.

Any existing airlock can be booby-trapped in this fashion and this modification consumes no tonnage.

Option	TL	Cost	Damage per Round
Basic	6	MCr0.1	3D
Improved	8	MCr0.3	5D
Enhanced	10	MCr0.5	6D
Advanced	12	MCr1	8D

BRIEFING ROOM

A specialised briefing room is useful on mercenary cruisers and other adventuring ships, where teams can discuss plans or meet with clients privately and they are commonly found on ships with fighter squadrons or marines.

When planning missions on board the ship, a briefing room grants DM+1 to Tactics (military) checks made during a subsequent military operation.

Option	Tons	Cost
Briefing Room	4	MCr0.5

COMMON AREAS

A standard ship's common area is used for dining and recreation. Most are pedestrian affairs with some chairs and tables, a refrigeration device, food dispensaries, a fresher, laundry facilities and possibly a holovision or other entertainment device. However, extravagant ship owners sometimes install more exotic entertainments. The following are but a few possible additions to the common area.

Advanced Entertainment System

Available as low as TL5, early systems focus on audio facilities but as Tech Levels advance, such systems rapidly advance to include visual mediums such as holovisions and virtual-reality gaming spaces. No tonnage is required. Cr100–10000, depending on Tech Level and sophistication.

Brewery or Distillery

One or more weeks in jumpspace can seem a long time, providing a great opportunity to learn how to make beer or liquor. Producing fine beer and other alcoholic beverages typically requires a factory-sized facility but at high Tech Levels, the entire process can take place in a fraction of the space. Most brewmasters and distillers use tried and true ingredients but if there is one thing that most species have discovered, it is that just about any photosynthetic plant ferments. Bold Travellers might want to create new and exciting drinks for their crewmates to enjoy. Microbreweries and distilleries appear at TL10 and require 0.5 tons to produce 10 litres of beer or liquor per week. Each ton of equipment costs MCr0.1.

Gourmet Kitchen

All ships' commons contain a galley at the very least but discerning captains add facilities for a finer culinary experience. These may include specialised ovens, refrigeration devices, food-preparation equipment and other items that enable a qualified steward to tantalise the palates of the crew and passengers. A minimum of Steward 2 is required to properly use such facilities, which consume one ton per diner and cost MCr0.2 per ton. Ships with a gourmet kitchen gain DM+1 when seeking high passengers.

COMMON AREAS (CONTINUED)

Hot Tub

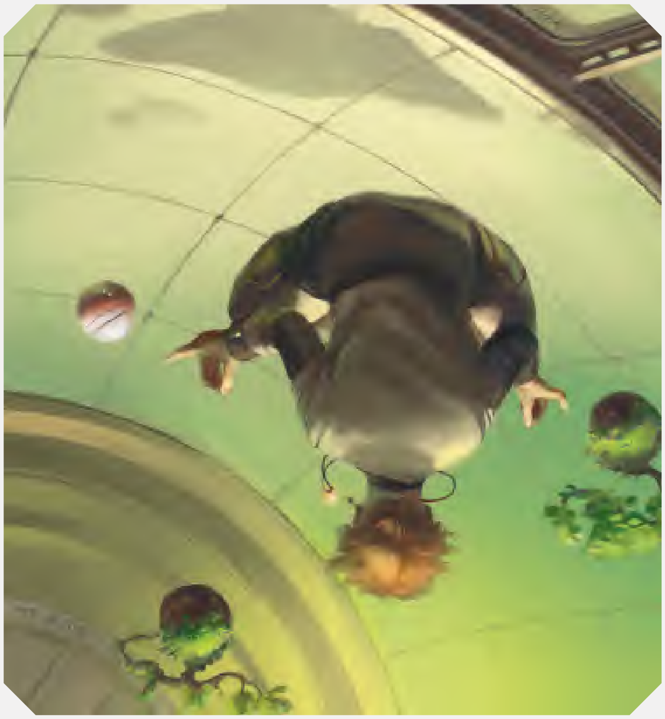
After a long day exploring alien worlds and fighting interstellar wars, there are few things more relaxing for the average Traveller than soaking in warm water with friends. A hot tub requires 0.25 tons for each Traveller intended to use it simultaneously and costs Cr12000 per ton.

Swimming Pool

There are two types of pool that can be installed in the common area: standard and endless. Standard pools are the typical sort found in a gymnasium, with room to swim for multiple Travellers. Endless pools are used for exercise and rehabilitation and can be quite small. Endless pools move their water using a propeller or – at higher Tech Levels, gravitics – in circular fashion to provide an artificial current for a Traveller to swim against. Standard pools consume a minimum of four tons and cost Cr20000 per ton. Endless pools consume two tons and cost Cr50000. Both come with sealing covers.

Theatre

To jump or not to jump, that is the question. Reasonably sized common areas can host live drama which, even in the year 1105, has its dedicated fans. Most ships that contain a theatre convert one or more staterooms into dressing rooms for the actors. The most basic theatre is little more than a stage and curtain but as Tech Levels increase, holographic effects, immersive sound systems and other enhancements can add to the experience. A basic theatre is a minimum of eight tons and costs MCr0.1 per ton. A more advanced theatre with programmable lights and sound costs MCr0.2 per ton. Advanced Theatres often incorporate holographic projectors to produce scenery and other elements to more fully immerse the audience in the narrative. Theatres become more expensive if additional features and technology are added. More lavish productions require a minimum of 12 tons with some shipboard theatres exceeding 20 tons.



Wet Bar

This is a basic wet bar, usually species-specific and tailored to the tastes of the ship's owner. Includes beer taps, wine refrigerators, liquor racks and similar items in the space where the common kitchen is located. No tonnage required. Wet bars cost Cr2000, not including the beverages.

Zero-G Room

A current trend in starship design is the inclusion of a zero-G room, which is essentially just an enclosed closet with the artificial gravity turned off. While there are no definitive studies that verify this, many spacers believe that time spent in zero-G is therapeutic, a welcome respite from simulated gravity where one can philosophise and ponder the mysteries of the universe. Zero-G rooms may be of any size. Controls and a safe-access portal (the transition from artificial gravity to zero-G can be disorienting and injurious without such a device) cost Cr50000. An engineer can actually turn any portion of a ship into an impromptu zero-G room at will, but without the requisite safety mechanisms, those without Athletics (dexterity) or Vacc Suit skills have a risk of injury upon entering the null-gravity space.

CONCEALED COMPARTMENT

A smuggler's favourite, concealed compartments are cunningly hidden from visual searches and shielded against sensors, allowing them to be used to transport contraband or other questionable items.

Up to 5% of a ship's tonnage can be designated as a concealed compartment which inflicts DM-2 to Electronics (sensors) checks and DM-4 to Investigate checks made to search for it.

Concealed compartments cost Cr20000 per ton.

CONSTRUCTION DECK

Primarily used on very large civilian vessels, this facility is effectively a mobile shipyard that can repair and build smaller ships. A construction yard can build a ship of tonnage equal to half the tonnage of the construction deck at a TL equal to the ship the construction deck is on.

Construction decks cost MCr0.5 and require 1 Power per ton.

DOCKING SPACE

This is an internal bay in which a smaller auxiliary ship or vehicle can dock. When sealed, the docking space completely covers the auxiliary ship. It takes 1D minutes for the auxiliary ship to enter or leave the larger ship. Docking space consumes an amount of tonnage equal to that of the largest ship to be docked, plus 10% (round up to the nearest ton). Use shipping size for vehicles, as detailed in the *Traveller Core Rulebook* and the *Vehicle Handbook.*

It takes D3 rounds to release or recover a ship of less than 2,000 tons, during which time neither ship can expend Thrust or make attack rolls. Larger ships take 1D rounds.

Option	Cost
Docking Space	MCr0.25 per ton

FULL HANGAR

Normally, when a smaller ship or vehicle is included in the design of a larger one, it is installed in a docking space, with barely enough room for crew and passengers to scramble aboard. Most repairs and maintenance require the craft to be launched first.

Alternatively, a full hangar allows for repairs and maintenance of the craft when it is on board its mother ship. The hangar includes specialised testing and repair equipment. Spare parts must be acquired separately. It normally takes 2D minutes for the auxiliary ship to enter or leave the larger ship.

A full hangar consumes an amount of tonnage equal to twice that of the craft it contains (round up to the nearest ton). Use Shipping Size for vehicles, as detailed in the *Traveller Core Rulebook.*

Option	Cost
Full Hangar	MCr0.2 per ton

GRAV SCREEN

A gravity screen blocks densitometers from scanning the inside of a ship, rendering them useless and returning error codes. They are impenetrable to this mode of scanning but the presence of gravity screens is obvious to a sensor operator.

Option	TL	Tons	Cost	Power
Grav Screen	12	1 per 200 tons of hull	MCr1 per ton	2 per ton

HARDENED SYSTEM

Any system that draws power from the power plant can be Hardened to render it immune to Ion weapons. A Hardened system has its cost increased by +50%.

LABORATORY

Space allocated to laboratories can be used for research and experimentation, effectively turning the ship into a space-going science vessel.

Every four tons dedicated to laboratories space allows one scientist to perform research on board the ship. The cost for research equipment varies depending on the nature of research undertaken but is generally about MCr1 for every four tons. Refer to the *Traveller Core Rulebook* for scientific toolkits available.

LAUNCH TUBE

Launching and recovering smaller craft from a larger ship is usually a time-consuming activity when using docking spaces or full hangars. Launch tubes allow craft to be launched rapidly, using electromagnetic technology similar to that used by railguns. Multiple launch tubes are often installed on capital ships that carry small craft, allowing them to launch potentially entire squadrons very quickly.

It takes one round to manoeuvre a craft into 'firing' position within a launch tube but, once there, it takes a single space combat round to release up to 10 craft, after which both the mothership and launched spacecraft may expend Thrust and make attack rolls during the same round.

A launch tube consumes an amount of tonnage equal to 10 times the size of the largest craft it must launch. In addition, each craft carried on the ship that use the launch tube must have a docking space or full hangar (using the costs and tonnage on page 61).

Option	TL	Cost	Power
Launch Tube	9	MCr0.5 per ton	1 per ton

LIBRARY

A library contains computer files as well as lecterns, display screens, holotanks and perhaps even hard copies of books. A good library is useful for both research and passing time in jump space.

Having a library on board a ship grants DM+1 on any EDU check made when training for new skills in jumpspace or other periods of extended inactivity.

Option	TL	Tons	Cost
Library	8	4	MCr4

MEDICAL BAY

The presence of a medical bay on a ship can mean the difference between life and death for the crew, so long as there are sufficiently trained personnel on board.

A medical bay grants DM+1 to all Medic checks made within it.

Each four tons attributed to medical bays supports the treatment of up to three patients so long as there is at least one medic or autodoc (see *Central Supply Catalogue*, page 81) present.

Multiple medical bays can be combined into one larger facility that serves more patients.

Option	Tons	Cost	Power
Medical Bay	4	MCr2	1

RE-ENTRY CAPSULE

These capsules enable the occupants of a spacecraft to quickly depart for the surface of any planet the ship is orbiting. They feature heavy heat-shielding and can provide a rocky, although relatively safe, passage through the atmosphere. Each capsule holds one person and is generally used as an emergency escape vehicle to save lives when a ship is in danger of being destroyed.

At TL10, assault capsules become available, used to deploy infantry directly onto a planetary surface, throwing out countermeasures as they go. They grant the occupant Protection +20 and inflict DM-2 on any Electronics (sensors) checks made to detect them.

At TL14, high-survivability capsules are available, an improvement on the assault capsule. They are heavily armoured and deploy multiple decoys as they plunge through the atmosphere. They grant the occupant Protection +30, inflict DM-4 on any Electronics (sensors) checks made to detect them, and DM-2 against any attack rolls.

RE-ENTRY POD

A re-entry pod is similar to a capsule but is built with a gliding surface and computer guidance, allowing it to avoid potentially dangerous terrain and deliver up to two occupants safely to a planet's surface. A skilled Traveller can take control of the pod's descent using the Flyer (wing) skill.

Option	TL	Tons	Cost
Re-entry Pod	9	1	MCr0.15

RECOVERY DECK

The counterpart of launch tubes, a recovery deck allows the rapid recovery of ships. This is used on a tactical level, bringing small craft (normally fighters) on board rapidly before a ship jumps and usually includes

Type	TL	Tons	Cost	Protection	Detection DM
Re-entry Capsule	8	0.5	Cr20000	—	—
Assault Capsule	10	0.5	Cr50000	+20	-2
High Survivability Capsule	14	0.5	MCr0.1	+30	-4

safety equipment that arrests the motion of any craft that enters it too quickly. A recovery deck may be used to store small craft on board a ship but it cannot function as a full hangar since it is open to vacuum.

A recovery deck recovers one craft every round.

A recovery deck consumes an amount of tonnage equal to 10 times the size of the largest craft it must recover. Multiple recovery decks can be combined into larger recovery decks, each capable of recovering more than one craft at a time.

Option	Cost	Power
Recovery Deck	MCr0.5 per ton	1 per ton

STABLE
Used by traders, stables are low-grade housing for animals and, in some systems, slaves. Stables come with their own air scrubbers and waste-collectors, avoiding the need to tax the existing life support systems of the ship.

A 10-ton stable is capable of housing 20 human-sized or 10 cattle-sized creatures.

Option	Tons	Cost	Life Support
Stable	Variable	Cr2500 per ton (min. 10)	Cr250 per ton

STUDIO
Space allocated to studios can be dedicated for specific specialities of the Profession skill. Every four tons of space dedicated to studios enables one Traveller to conduct their profession on board the ship.

Option	Tons	Cost
Studio	4	MCr0.1 per ton

TRAINING FACILITIES
Mercenary companies based in ships have a particular problem not suffered by ground-based organisations. While training office workers and support units is easily done around the ship, given enough free space, combat training is much harder. For this reason, many mercenary space vessels incorporate training facilities into their design with thick bulkhead walls to stop rounds from penetrating and multiple gyms, prep rooms and firing ranges. This allows for new recruits to be trained and old hands to keep their skills up.

Option	Tons	Cost
Training Facilities	2 per trainee	MCr0.2 per ton

UNREP SYSTEM
This is a system designed to allow for replenishment and resupply of warships while in motion and is vital to the function of squadrons in unexplored or hostile systems. The system includes fuel hoses, cargo transfer tubes and other gear designed to move ordnance and freight between two ships (although only one of the ships is required to carry the UNREP system).

Each ton dedicated to the UNREP system allows the transfer of 20 tons of fuel, cargo or ordnance every hour.

Option	Cost	Power
UNREP System	MCr0.5 per ton	1 per ton

VAULT
A vault is a secure armoured chamber placed within the heart of a ship designed to survive attacks that might annihilate the rest of a vessel.

A vault usually survives the destruction of its ship and is sealed so any occupants contained within can survive in a vacuum for a limited period of time. The vault can contain cargo, staterooms or any other internal ship components. Vaults vary between 4–40 tons.

Option	Cost	Armour	Hits
Vault	MCr0.5 per ton	1 per ton (max. 10)	1 per 5 tons

WORKSHOP
A workshop can be used to repair broken equipment and fabricate new items, and is a common feature on scouts and other ships that operate in the wilderness areas of space. Each workshop allows for two Travellers to use the Mechanic skill on board the ship with DM+2.

Option	Tons	Cost
Workshop	6	MCr0.9

SPACE STATIONS

Often larger than the mightiest capital ships, space stations are a vital component of any interplanetary society's military, economic and social structure, providing living space, manufacturing facilities and a stepping stone into deep space. Some space stations are dedicated to military operations and may be better described as battle stations, while others are specialised for industrial production, ship-building or habitation. Given the resources needed to build the largest space stations, however, most can handle a multitude of functions, acting as a trading post or space port with industrial facilities but serving the needs of warships when necessary.

This chapter describes everything you will need to construct space stations and then operate them within a living universe.

CONSTRUCTION

Space stations are designed and built in the same fashion as ships, with a few differences. Unless stated otherwise in this chapter, all rules that apply to ships also apply to space stations – in effect they are treated as large and (mostly) immobile spacecraft.

STEP 1: CREATE A HULL

1,000 tons – research facility or orbital defence station
100,000 tons – modest space station
1 billion tons – orbital highport of a populous world

Any configuration except streamlined (space stations do not enter atmospheres!). See page 10 of the ship design sequence. Most space stations use a dispersed structure.

Space stations with non-gravity hulls can be of unlimited size.

STEP 2: INSTALL DRIVES

Manoeuvre drive with Thrust 0 consumes tonnage equal to 0.25% of the space station's total hull and costs MCr1 per ton. Enables the station to make flight corrections to stay in orbit.

Stations without a manoeuvre drive must be adjusted manually by a tug or other suitable spacecraft.

STEP 3: INSTALL POWER PLANT

Two main power requirements:

BASIC SYSTEMS

Artificial gravity, heating, lighting and life support.
Required Power = 20% of hull tonnage.

MANOEUVRE DRIVE

Required power = 10% of hull tonnage. See Install Power Plant on page 17.

STEP 4: INSTALL FUEL TANKS

Chemical power plants require 10 tons of fuel per ton of power plant for every two weeks of operation.

Other power plants require fuel tankage equal to 10% of their size (round up, minimum one ton). This provides enough fuel for the power plant for four weeks. Multiply this figure for extended performance. For example, double its size for eight weeks, triple it for 12 and so on.

STEP 5: INSTALL CONTROL CENTRE

The control centre is the 'bridge' of a space station. The cost is MCr0.1 per 100 tons (or part of) of the station it is installed within.

Size of Space Station	Size of Control Centre
500–tons or less	10 tons
501–5,000 tons	20 tons
5,001–20,000 tons	40 tons
20,001–100,000 tons	60 tons
100,001–2,500,000 tons	80 tons
2,500,001 tons+	100 tons

COMMAND AND CONTROL CENTRE

This is installed in military space stations and functions like a command bridge on a starship, enabling the station to command fleets across an entire star system. Command and control centres are double the cost of a command centre of the same size and grant DM+1 to all Tactics (naval) checks made by its staff.

STEP 6: INSTALL COMPUTER

See page 20 of the ship design sequence.

STEP 7: INSTALL SENSORS

See page 21 of the ship design sequence. Large space stations should have redundant sensor arrays.

STEP 8: INSTALL WEAPONS

Space stations may install all available weapons. However, due to their lack of manoeuvrability, few install spinal mount weapons.

See Weapons and Screens on page 26.

STEP 9: INSTALL OPTIONAL SYSTEMS

Select from all available spacecraft options and the options listed in *Space Station Options* on page 66.

STEP 10: DETERMINE CREW

Use the Crew Requirements table to determine how many personnel are required. Salaries shown are the monthly average for skill level 1 crew; add +50% for every skill level above 1. For large space stations (more than 5,000 tons) note the Large Ships modifiers on page 22 to obtain final totals.

STEP 11: INSTALL ACCOMMODATIONS

Install standard, high and luxury staterooms for crew and official visitors, optionally allowing for double occupancy for non-command roles.

Low berths are rare except on military stations where they are used for frozen watch.

See Residential Zones on page 66 for resident accommodations and an alternative approach to crew residences.

COMMON AREAS AND LIVING SPACE

Apply half the tonnage used for all accommodations and residential zones. Includes recreation areas, mess halls and restaurants, parks, pools, theatres and so on, for station residents. Common areas cost MCr0.1 per ton.

AIRLOCKS AND CARGO HATCHES

One airlock per 500 tons of space station. Install additional airlocks and cargo hatches as described on page 25 of the ship design sequence.

STEP 12: ALLOCATE CARGO SPACE

Remaining space may be designated as cargo holds. For military space stations, note the Supplies, Spares and Stores rules on page 52.

Crew Requirements

Position	Skills	Salary	Commercial	Military
Captain	—	Cr10000	Usually the leading officer	1
Engineer	Engineer	Cr4000	1 per 35 tons of drives and power plant of space station and small craft	1 per 35 tons of drives and power plant of space station and small craft
General Crew	Profession	Cr1000	As detailed in Space Station Options	As detailed in Space Station Options
Maintenance	Mechanic	Cr1000	1 per 1,000 tons of space station and contained small craft	1 per 500 tons of space station and contained small craft
Medic	Medic	Cr4000	1 per 120 crew and passengers	1 per 120 crew
Gunner	Gunner	Cr2000	Add crew for all turrets, barbettes, bays and screens	3 x crews for all turrets, bays, and screens, and 1 crew per 100 tons of spinal mount weaponry
Administrator	Admin	Cr1500	1 per 2,000 tons of space station	1 per 1,000 tons of space station
Officer	Leadership or Persuade	Cr5000	1 per full 20 crew	1 per full 10 crew
Sensor Operator	Electronics (sensors)	Cr4000	1 per 7,500 tons of space station	3 per 7,500 tons of space station

RESIDENTIAL ZONES

On advanced worlds, population often outstrips demand for space and huge orbital colonies are created. In other systems, people live on space stations because of dangerous environments planetside or simply because of personal preference. The number of people who can be housed within residential spaces depends on the resources and space allocated to it, as shown on the Residential Zones table. This table lists approximate SOC suited to the housing and facilities, as well as the tonnage consumed per person housed, the cost per ton and Power required for every 100 tons or part of consumed by the residential zone.

Residential zones are essentially interchangeable with stateroom accommodations. Stations that use both typically install stateroom facilities strictly for crew and official visitors while residential zones are considered urban environments in which non-station-personnel live. Egalitarian or economical space stations sometimes house their crew with the rest of the station population in the residential zones instead of sequestering them in their own area.

Residential Zones

Quality	SOC	Tons per Person	Power per 100 tons	Cost per Ton
Low	1+	2	1	MCr0.05
Medium	4+	4	2	MCr0.1
High	8+	6	3	MCr0.25
Luxury	10+	10	5	MCr0.75

STEP 13: FINALISE DESIGN

Calculate annual maintenance by taking the total cost of the station and divide this figure by 12,000 for the monthly cost.

Calculate total life support and reduce by 25–50% to account for typical occupied usage of accommodations and residential facilities.

SPACE STATIONS IN BATTLE

In combat, space stations are treated as if they were ships, with the following exceptions:

- Space stations cannot manoeuvre to any appreciable degree in combat and thus follow very predictable orbital paths. All attack rolls made against space stations gain DM+4.
- So long as the position of the space station is known, missiles and torpedoes can be used against space stations at any range, effectively coasting to their target in the final stages of attack. However, if the missile or torpedo is making an attack after it has expended its fuel, any point defence gains DM+2 against it.
- Space stations may never engage in any kind of combat manoeuvring (see the *Traveller Core Rulebook*, page 164).

SPACE STATION OPTIONS

In addition to residential zones, listed above, the following options greatly expand their utility.

COMMERCIAL ZONE

Shops, offices, trading halls, restaurants and trinket stalls, are all required to attract regular customers to a space station. At the low end, commercial zones can simply be partitioned areas that are adapted by tenants but advanced space stations are likely to offer extensive business and commercial facilities, such as trading networks, conference centres and attractive plazas.

Commercial zones cost MCr0.2 per ton and require 1 Power for every 200 tons.

DEEP-SPACE COMMUNICATIONS RELAY

The longest delay in the x-boat network, other than the necessary week-long jump, is the time it takes for the real-space transfer from the 100-diameter limit to a central hub station. In some cases, a space station can work around this by using a high-capacity network that transmits huge reams of data directly to x-boats and the mail pods they carry. If an x-boat is carrying cargo and physical mail, it must visit a space station equipped with a deep space communications relay and warehouse or cargo transfer facility. If there are no physical goods to deliver, x-boats can exchange information from anywhere in the system in relatively short order (only accounting for time lag on the data transfer, which occurs at the speed of light). In this case, the x-boat can refuel – possibly simultaneously with the data transfer operation – and move on immediately thereafter.

A deep-space communications relay becomes available at TL10. It consumes 500 tons and costs MCr50. At TL12, the relay has undergone enough refinement to only consume 250 tons and costs MCr100. An advanced version is available from TL13 that only consumes 150 tons and costs MCr150.

DOCKING FACILITY

Unless they are extremely specialised, space stations must have a way of connecting with ships in order to survive and prosper, be they traders looking to exchange goods, warships coming for refits or supply ships bringing vital materials and replacement crew.

All space stations are capable of externally docking with a number of ships whose total tonnage does not exceed twice their own tonnage. Alternatively, a single ship of any size can dock with a space station. This is achieved through the use of docking arms and clamps, which are assumed to be purchased and installed during the construction of the space station's hull.

The largest space stations are capable of receiving ships within internal bays. This provides ships with protection and makes repairs and the transfer of goods and passengers much easier.

SHIPS AND STATIONS

With the Referee's approval, space station modules can be installed on other spacecraft as well. There is no reason why a large enough ship could not, for example, have a deck dedicated to mining and refining ore from asteroids.

Fundamentally, a space station is a ship that lacks mobility. Aside from that, there are no real differences between a space station and a ship.

This kind of docking facility consumes three tons for every ton of the largest ship it is capable of handling or the total tonnage of ships it can handle at any one time (so, a 6,000-ton docking facility can hold ships totalling up to 2,000 tons).

For every ton they consume, docking facilities cost MCr0.25. They also need one crewman for every 100 tons.

FUEL REFINERY

The production of refined fuel in space has three distinct steps from start to finish; gather unrefined fuel, refine it, then store and distribute it. A space station with a fuel refinery must be in orbit of either a gas giant or a world with water present in order to function.

The gathering of unrefined materials is performed by streamlined scoop drones – flying wings with bulbous fuel bays. They fly through the atmospheres of gas giants or scoop up water from oceans. In asteroid belt systems, they extract water from planetoids. After obtaining raw gases or water, they return to the space station to refine it for hydrogen.

A fuel refinery is a collection of high-end processing machinery that turns water and gases into starship fuel. The Fuel Refinery table shows how much fuel each refinery is capable of producing per day per ton dedicated to it, along with its Power requirement. The table also shows how many crew are needed to service the refinery. Space dedicated to refineries includes hangars and other facilities required for scoop drones to bring the raw materials back to the space station.

Fuel Tanks: Normal cargo space cannot be used to store processed fuel. Instead, large fuel tanks must be built at a cost of Cr50000 per ton.

MANUFACTURING PLANT

Orbital manufacturing facilities enable the production of vast amounts of goods. The types of goods created are dependent on the type of manufacturing plant, including the following: Basic, Advanced, Specialist and Agricultural, as shown on the Manufacturing Plant table. This table also shows the cost and Power requirement per ton and how many tons of manufacturing plant are needed to produce one ton of goods per day.

The rate of production can be improved if goods are manufactured in a system that can provide the needed raw materials quickly and easily. If the system

Fuel Refinery

TL	Maximum Output Per Day	Power	Crew	Cost
7	10 tons	2	1 per 50 tons	MCr0.1 per ton
10	12 tons	1	1 per 100 tons	MCr1 per ton
13	15 tons	1	1 per 500 tons	MCr0.5 per ton

the space station is within meets the Trade Code requirement in the Goods table, then production is increased by 25%.

MINERAL REFINERY

Mineral refineries convert asteroids into useful metals and materials. Some are made up of individual platforms, each of which contribute to the operation and others are distributed systems with multiple substations coordinated by a central hub. This is an alternative to mining asteroids and transporting only the ore, as practiced by ships such as the seeker on page 162.

Mineral refineries rely on manned tugs to bring suitable asteroids to the space station, although at TL12 these are replaced by tug drones.

Once asteroids are delivered to the station, they must be crushed, the ores and other by-products sorted, and waste released back into space. The produce is split

Manufacturing Plant

Plant	TL	Plant per ton of Goods	Power	Crew	Cost
Basic	7	10 tons	1	1 per 5 tons	MCr0.2
Advanced	10	25 tons	2	1 per 2 tons	MCr0.4
Specialist	9	50 tons	2	1 per 3 tons	MCr1
Agricultural	8	20 tons	1	1 per 10 tons	MCr0.5

Goods

Goods	Plant Type	Trade Code
Common Electronics, Machine Parts, Manufactured Goods	Basic	None
Common Consumables	Agricultural	None
Advanced Electronics, Machine Parts, Manufactured Goods	Advanced	Industrial
Advanced Weapons	Advanced	High Tech
Advanced Vehicles	Advanced	High Tech
Biochemicals	Agricultural	Water World
Cybernetics	Specialist	High Tech
Live Animals	Agricultural	Agricultural
Luxury Consumables	Agricultural	Agricultural
Luxury Goods	Specialist	High Population
Medical Supplies	Specialist	High Tech
Pharmaceuticals	Specialist	Asteroid
Polymers	Basic	Industrial
Robots	Specialist	Industrial
Spices	Agricultural	Desert
Textiles	Basic	Agricultural
Wood	Agricultural	Agricultural
Vehicles	Basic	Industrial

between 50% Common Ore, 30% Uncommon Ore, 15% Crystals and Gems and 5% Precious Metals (as defined on page 244 of the *Traveller Core Rulebook*). For example, for every 100 tons of produce from the refinery, 50 tons is Basic Ore, 30 tons is Uncommon Ore, 15 tons Crystals & Gems and five tons Precious Metals.

Technology rapidly enhances the capabilities of a mineral refinery. The Mineral Refinery table shows how much produce each refinery is capable of producing per day, per ton dedicated to it, along with its Power requirement. The table also shows how many crew are needed to service the refinery. Space dedicated to refineries includes hangars and other facilities required for tugs to bring asteroids back to the space station.

Mineral Refinery

TL	Maximum Output Per Day	Power	Crew	Cost
7	0.5 tons	5	1 per 10 tons	MCr0.5 per ton
10	1 tons	2	1 per 20 tons	MCr1 per ton
13	2 tons	1	1 per 50 tons	MCr2 per ton

Cargo space is normally dedicated to storing the produce from a refinery.

Smelter: Ores are the normal end-product of a mineral refinery but many stations also conduct on-board processing to create more valuable materials. A smelter allows Common Ores to be processed into Common Raw Materials and Uncommon Ores into Uncommon Raw Materials. Each ton of smelter allows the processing of 0.2 tons of Ores into 0.1 tons of Raw Materials per day. A smelter costs MCr0.5 and requires 1 Power per ton.

SHIPYARD

The smallest shipyards are found on civilian stations for the construction of small craft but far larger construction sites can be found on the stations of megacorporations and militaries. Shipyards provide the facilities needed to build ships to the Tech Level of the space station.

A shipyard consumes two tons for every ton of the largest ship it is capable of building or the total tonnage of ships it can build at any one time (so, a 10,000-ton shipyard can build ships totalling up to 5,000 tons). For every ton they consume, shipyards cost MCr0.5 and require 1 Power. They also need one crewman for every 10 tons.

In order to construct ships with jump drives, a shipyard must be of a suitable Tech Level, as defined on the Jump Potential table on page 16. So, for example, to build jump-3 ships, a shipyard must be at least Tech Level 12. Shipyards capable of building ships with jump drives have their cost increased to MCr0.75 per ton.

STARPORTS

It is possible for a space station to be classed as a starport for a system. This can be either as a highport servicing ships that cannot reasonably reach planetside facilities or as the sole starport within a system. The class of starport a space station can be rated as depends on the facilities it can offer, as shown on the Starports table. All the facilities listed are minimums the starport must have installed.

Note that while a space station might qualify as a starport by having the right facilities, that does not necessarily mean it is classified as one. Commercial pressures might force the designated starport to be elsewhere in the system or the local government might forbid a space station from being used for this purpose.

Starports

Class	Sensors	Total Docking Space	Berthing fees	Refined Fuel per Day	Commercial Zones	Residential Zones	Shipyard
A	Improved	100,000 tons	1D x Cr1000	2,500 tons	25,000 tons	10,000 tons	25,000 tons
B	Civilian	50,000 tons	1D x Cr500	1,000 tons	5,000 tons	2,500 tons	10,000 tons
C	Civilian	20,000 tons	1D x Cr100	—	100 tons	100 tons	200 tons
D	Basic	400 tons	1D x Cr10	—	100 tons	—	—
E	—	—	—	—	—	—	—
X	—	—	—	—	—	—	—

CUSTOMISING SHIPS

By adjusting Tech Levels, many ship components can be upgraded or downgraded depending on the needs and capabilities desired by the ship's designer. Superior components provide enhanced performance while lesser components may be installed to reduce costs or, in the case of a lower-tech world, to provide prototype technology before it might otherwise be available.

After being in service for any length of time, ship components can be damaged, destroyed or made obsolete by higher technology. This chapter provides rules for refitting ships with new components and the associated costs of doing so.

ALTERING TECH LEVELS

The Tech Level, price and tonnage of components can be adjusted while a ship is being designed. Ships built at higher or lower Tech Levels have one or more Advantages or Disadvantages applied to reflect the effect of higher or lower technology.

In the design sequence, every component that can be mounted on a ship has a minimum Tech Level listed, which dictates when it normally comes available. The pulse laser on page 29, for example, is listed as being TL9. In theory prototype lasers can appear at lower Tech Levels, although they will be less capable and more advanced versions become available at higher Tech Levels.

Prototype/Advanced

	TL	Tonnage	Cost	Modifications
Early Prototype	-2	+100%	+1000%	2 Disadvantages
Prototype	-1	—	+500%	1 Disadvantage
Budget	+0	—	-25%	1 Disadvantage
Advanced	+1	—	+10%	1 Advantage
Very Advanced	+2	—	+25%	2 Advantages
High Technology	+3	—	+50%	3 Advantages

When selecting prototype (lower TL) or advanced (higher TL) components, use the Prototype/Advanced table to alter its TL, tonnage and cost, and to determine how many Advantages or Disadvantages it acquires. Advantages and Disadvantages are then selected from a suitable category in this chapter or the Referee and Travellers can create their own.

A component may have either Advantages or Disadvantages but not both.

Where the Referee deems it appropriate, the same Advantage or Disadvantage can be applied more than once to a component, increasing or decreasing its quality. All alterations are additive. For example, if two +10% alterations are taken, the net modification is 20%.

Make sure to only recalculate per the description. For example, when an Advantage or Disadvantage increases or decreases the size of a component, calculate the modified price based on the original size of the item, not the modified size.

JUMP DRIVE ADVANTAGES

Decreased Fuel: This drive uses 5% less fuel then normal.
Early Jump: This drive can jump 10% closer to a gravity well than normal (90 diameters, as detailed on page 157 of the *Traveller Core Rulebook*).
Energy Efficient: This jump drive consumes 25% less Power than normal.
Size Reduction: This reduces the tonnage consumed by the jump drive by 10%. This can take the drive below the minimum size of 10 tons.
Stealth Jump: A stealth jump drive minimises the burst of radiation caused by the transition from jump space into real space. Normally, a ship that emerges into real space is automatically detected if it emerges within the minimum detail range of the sensor. However, detecting a ship equipped with a stealth drive emerging into real space requires a Formidable (14+) Electronics (sensors) check (1D rounds, INT or EDU) if it is within the 'limited' detail range of the sensors or automatically fails if outside the minimum detail range. Stealth jump requires two Advantages.

JUMP DRIVE DISADVANTAGES

Energy Inefficient: This jump drives consumes 30% more Power than normal.
Late Jump: This jump drive needs to be 50% further from a gravity well than normal (150 diameters, as detailed on page 157 of the *Traveller Core Rulebook*).
Increased Size: This increases the tonnage consumed by the jump drive by 25%.

MANOEUVRE DRIVE ADVANTAGES

Energy Efficient: This manoeuvre drive consumes 25% less Power than normal.
Size Reduction: This reduces the tonnage consumed by the manoeuvre drive by 10%.

MANOEUVRE DRIVE DISADVANTAGES

Energy Inefficient: This manoeuvre drive consumes 30% more Power than normal.
Limited Range: This manoeuvre drive only functions within the 100-diameter limit (see page 148 of the *Traveller Core Rulebook*).
Increased Size: This increases the tonnage consumed by the manoeuvre drive by 25%.
Orbital Range: This manoeuvre drive only functions when the ship is within Short range (up to 1,250 kilometres) of a planetary body. Orbital range requires two Disadvantages.

REACTION DRIVE ADVANTAGES

Fuel Efficient: This reaction drive requires 20% less fuel than normal.

REACTION DRIVE DISADVANTAGES

Fuel Inefficient: This reaction drive requires 25% more fuel than normal.

POWER PLANT ADVANTAGES

Increased Power: This power plant produces +10% more Power than normal (round up). Increased Power requires two Advantages.
Size Reduction: This reduces the tonnage consumed by the power plant by 10%.

POWER PLANT DISADVANTAGES

Energy Inefficient: This power plant produces -25% less Power than normal.
Increased Size: This increases the tonnage consumed by the power plant by 25%.

WEAPON AND SCREEN ADVANTAGES

Referees might want to restrict the use of these rules with spinal mount weapons, as they already have their own table for varying Tech Levels.

Accurate: Accurate weapons gain DM+1 to all attack rolls. Accurate requires two Advantages.
Easy to Repair: Easy to Repair weapons grant DM+1 to all attempts made to repair them.
Energy Efficient: This weapon consumes 25% less Power than normal.

High Yield: When rolling damage for a High Yield weapon or the performance of a High Yield screen, any ‘1’s rolled are counted as ‘2’s. Not applicable for missiles and torpedoes.
Very High Yield: When rolling damage for a Very High Yield weapon or the performance of a Very High Yield screen, any ‘1’s and ‘2’s rolled are counted as ‘3’s. Very High Yield requires two Advantages. Not applicable for missiles and torpedoes.
Intense Focus: These weapons are more tightly focused allowing them to better cut through armour. Intense Focus weapons gain AP+2. Intense Focus can only be applied to lasers and particle weapons. Intense Focus requires two Advantages.
Long Range: The range for the weapon is increased by one band, to a maximum of Very Long. For example, a Long Range beam laser will change from Medium to Long range. Long Range requires two Advantages and may only be applied once.
Resilient: The Severity of all critical hits upon a Resilient weapon is reduced by -1.
Size Reduction: This reduces the tonnage consumed by the weapon by 10%. Not applicable to turret weapons.

WEAPON AND SCREEN DISADVANTAGES

Energy Inefficient: This weapon consumes 30% more Power than normal. Not applicable to turret weapons.
Inaccurate: This weapon suffers from continual alignment problems, inflicting DM-1 to all attack rolls.
Increased Size: This increases the tonnage consumed by the weapon by 20%.

REFITTING SHIPS

Over the course of a ship’s lifespan, its components may be modified or replaced. Sometimes this occurs after the ship has suffered damage in space combat or otherwise. Damaged and destroyed components can be replaced at starports of an appropriate Tech Level, provided that they have replacement parts and technology on hand. Components may also be replaced in order to upgrade or downgrade a ship’s capabilities. Tech Levels vary from world-to-world and Travellers who want to install better sensor arrays, improve the lethality of their weapons or otherwise enhance their ships have many choices.

All refits must take place at starports of Class B or above and jump drives can only be removed and fitted at Class A starports. Any refitting, even if it just the removal of minor systems, takes up shipyard capacity equal to the tonnage of the ship that is undergoing refit.

There are two different types of refit that can be used. Major refits cover changes in power plant, manoeuvre or jump drive, as well as changes to spinal mounts or launch facilities (such as launch tubes). Removing these components costs 0.5 times the cost of the original system, while removing them and then installing new ones costs 1.5 times the cost of the new system. The time this takes is one quarter of the time required to build a new ship of the same size as described in Construction Times on page 8.

Minor refits are changes to any other components aboard the ship, such as weapon mounts or staterooms. Removing these components costs 0.1 times the cost of the original system, while removing them and installing new ones costs 1.1 times the cost of the new system. This takes one tenth of the time required to build a new ship of the same size. Armour and other parts of the ship integral to the hull (such as configuration or reinforced structure) cannot be changed under any refit. Those items covered under a major refit cannot be increased in size but they can be reduced. Other components can be increased in size if there is tonnage available. If several systems or components are being removed or replaced in a single refit, all replacements are made simultaneously; therefore, it only takes the time required for the longest job to be completed.

The time taken for a refit to be completed can be modified in the same way as ship construction, such as allocating additional shipyard space or the presence of higher technology.

THE SHIP'S COMPUTER

A ship's computer shares much in common with portable systems but is immensely more powerful. The complex calculations required for quick and easy travel between planets and using jumpspace need suitable hardware with a lot more processing power. However, while the computing power available to the average merchant ship is staggering enough, capital ships tend to carry multiple distributed networks that can effectively provide unlimited processing potential.

This has led to the creation of software packages far more advanced than those running on portable computer systems, each granting a ship a wide range of comprehensive capabilities that not only allow it to travel safely and without error across the immense distances between stars, but also function far more effectively when it reaches its destination.

This chapter looks at advanced software available for ship's computers, although note that any sufficiently powerful computer can run this software.

When selecting a ship's computer, the first thing to do is determine what software it needs to run. Then total the Bandwidth required for each software package to get a sense of the total Bandwidth needed. Be sure to include the software packages listed on page 161 of the *Traveller Core Rulebook*.

Keep two things in mind when selecting software; first, make sure to select only the packages that the ship needs to function. It is easy to get carried away, packing in more than needed. For example, a ship with a pair of double missile turrets does not require expensive Launch Solution software. Nor does a tramp trader need costly Evade software to function safely (most of the time). Second, consider that not *all* of a ship's software needs to run simultaneously, enabling the designer to select a cheaper computer with less Bandwidth. Determine which software packages need to be running concurrently, add up their Bandwidth consumption and let that figure inform software purchasing decisions.

ADVANCED FIRE CONTROL

The basic Fire Control packages available to most ships (see the *Traveller Core Rulebook*, page 161) are suitable for small ships with a handful of turrets but they quickly surpass their capabilities on larger vessels with multiple weapon systems. Advanced Fire Control software utilises the greater processing potential of capital ships to create an entire offensive network that increases the efficiency of gunnery crew. Note that Advanced Fire Control does not allow a ship's computer to fire any weapons itself, merely increasing the accuracy of those who do. Advanced Fire Control does not stack with Fire Control.

All weapons mounted upon the ship gain a DM to their attack rolls equal to the Advanced Fire Control package's score (so, Advanced Fire Control/2 grants DM+2 to all attack rolls).

Software	Bandwidth	TL	Cost
Advanced Fire Control/1	15	TL10	MCr12
Advanced Fire Control/2	25	TL12	MCr15
Advanced Fire Control/3	30	TL14	MCr18

ANTI-HIJACK

This software package constantly monitors airlocks, access to critical areas and attempts to break into computer systems. In the event it discovers an anomaly, the software automatically shuts down access to the affected area, making unauthorised attempts to enter key areas and functions difficult. This is intended to act as a ward against hijacking but also serves as a strong security system. Any skill check made to gain unauthorised entry to the ship's computer or any restricted area suffers a negative DM equal to double the Anti-Hijack's software score.

Software	Bandwidth	TL	Cost
Anti-Hijack/1	2	TL11	MCr6
Anti-Hijack/2	10	TL12	MCr8
Anti-Hijack/3	15	TL13	MCr10

BATTLE NETWORK

The Battle Network software package enables a ship to hand off target sensor detection data to all desired ships within the specified range of the software. Battle Network/1 enables hand-off to all ships within Medium range. Battle Network/2 enables hand-off to all ships within Long range. For more information about sensor hand-offs, see Chapter 7: Sensors.

Software	Bandwidth	TL	Cost
Battle Network/1	5	TL12	MCr5
Battle Network/2	10	TL14	MCr10

BATTLE SYSTEM

The Battle System software package is a complex suite of programmes that interact with each other and other ship-board systems to create a tactical view of fleet actions. It then runs high-level simulations and makes predictions to advise officers as to the correct course of action. Any Traveller using Battle System gains a DM to Tactics (naval) checks equal to the Battle System package's score (so, Battle System/2 grants DM+2).

Software	Bandwidth	TL	Cost
Battle System/1	5	TL9	MCr18
Battle System/2	10	TL12	MCr24
Battle System/3	15	TL15	MCr36

BROAD SPECTRUM EW

While a software package cannot match a skilled sentient electronics warfare officer, computers can act much faster, disrupting entire salvoes in the time it takes an operator to simply notice a launch. The Broad Spectrum EW package continuously scans for hostile missile launches and automatically sends disruptive signals known to interfere with the guidance systems of all common missiles. A single electronic warfare action (with no crew skill DM applied) is automatically performed against any and all enemy salvoes launched within Long range. Each salvo can still only be subjected to one electronic warfare action, so manual attempts to disrupt salvoes should be performed beforehand.

Software	Bandwidth	TL	Cost
Broad Spectrum	12	TL13	MCr14

CONSCIOUS INTELLIGENCE

A Conscious Intelligence is far more than a basic Intellect package or a mere artificial intelligence. A Conscious Intelligence is a fully aware, completely sentient digital being, capable of thought, deduction, analysis and, it appears in every measurable way, emotion. A Conscious Intelligence is treated as a computer-bound Traveller with INT 15 and EDU 15, with a range of skills that can be uploaded, changed and improved (typically in the skill level 3–5 range). The Conscious Intelligence will have a name, an easily recognisable personality and is considered, by all ways except the biological, alive.

Software	Bandwidth	TL	Cost
Conscious Intelligence/1	40	TL16	MCr25
Conscious Intelligence/2	25	TL17	MCr20
Conscious Intelligence/3	10	TL18	MCr15

ELECTRONIC WARFARE

With access to the ship's sensor suites, this software package provides aid to the vessel's electronic warfare experts by quickly finding the correct frequencies to disrupt a target and then applying massive processing power to break through any firewall security.

All electronic warfare actions (see page 160 of the *Traveller Core Rulebook*) performed from the ship gain a DM to their Electronics (sensors) checks equal to the Electronic Warfare package's score (so, Electronic Warfare/2 grants DM+2).

Software	Bandwidth	TL	Cost
Electronic Warfare/1	10	TL10	MCr15
Electronic Warfare/2	15	TL13	MCr18
Electronic Warfare/3	20	TL15	MCr24

LAUNCH SOLUTION

Using complex calculations to mark the trajectories of entire salvos of missiles, the Launch Solution software package optimises missile and torpedo attacks to devastating effect.

All missile and torpedo salvoes fired by the ship gain a DM to their attack rolls equal to the Launch Solution package's score (so, Launch Solution/2 grants DM+2 to all missile and torpedo salvo attack rolls).

Software	Bandwidth	TL	Cost
Launch Solution/1	5	TL8	MCr10
Launch Solution/2	10	TL10	MCr12
Launch Solution/3	15	TL12	MCr16

POINT DEFENCE

While any ship with a laser turret can engage in point defence against incoming attacks, the computing power required to effectively shield another ship is staggering, relying on complex calculations of the trajectories of enemy ships, friendly targets and the actual weapons used. A ship running the Point Defence package may use point defence batteries and the Point Defence (gunner) reaction to defend any ship within Close range. The Point Defence/2 package increases this range to Short.

Software	Bandwidth	TL	Cost
Point Defence/1	12	TL9	MCr8
Point Defence/2	15	TL12	MCr12

SCREEN OPTIMISER

The Screen Optimiser package takes control of any screens mounted on a ship and automatically configures them on the fly to best degrade enemy attacks. It automatically performs the Angle Screens (gunner) action with a total DM+0, against any attack and can use any number of screens simultaneously.

Software	Bandwidth	TL	Cost
Screen Optimiser	10	TL10	MCr5

VIRTUAL CREW

While ships are vastly complicated to run, requiring highly trained crews, relatively simple operations can be performed by this software package. Virtual Crew can replace up to five pilots, gunners or sensor operators on board a ship, potentially allowing the ship to act autonomously if all crew can be replaced in this way. Indeed, ships can be designed without a bridge, relying purely on this software package in order to function as a drone. Ships that have no living crew make appropriate checks with a skill level equal to their Virtual Crew score and can also be controlled through the use of the Electronics (remote ops) skill. When using Electronics (remote ops), DM-2 is applied to all checks made if the drone ship is at Long range to the controller and DM-4 if it is at Very Long range. A drone ship cannot be remotely controlled at Distant ranges and must rely on its own programming. The package can replace any number of crew, although it requires +1 Bandwidth for every five crew or part of beyond the first five.

Software	Bandwidth	TL	Cost
Virtual Crew/0	5	TL10	MCr1
Virtual Crew/1	10	TL13	MCr5
Virtual Crew/2	15	TL15	MCr10

VIRTUAL GUNNER

A Virtual Gunner package allows a ship's computer to replace living gunnery crew in an efficient manner. The package can replace any number of gunners, although it requires +1 Bandwidth for every 10 gunners or part of beyond the first 10. Weapons controlled by a Virtual Gunner have a skill level equal to the package's score but they can take advantage of other modifiers such as Advanced Fire Control. On a military ship, one virtual gunner may replace the gunner crewing a turret, barbette, bay or screen.

Software	Bandwidth	TL	Cost
Virtual Gunner/0	5	TL9	MCr1
Virtual Gunner/1	10	TL12	MCr5
Virtual Gunner/2	15	TL15	MCr10

SENSORS

Space combat in the *Traveller Core Rulebook* assumes that the combatants have detected each other with sensors. However, initial detection of a ship relies upon a number of factors.

Ships have two types of sensors: active and passive. Active sensors are detectable by other ships because they emit radiation that announces their presence when detected by devices. For example, radar transmits and receives radio waves, which enable a ship to detect the location of ships and other objects; however, other radar systems have receivers that detect the transmission and trace it back to its source.

Passive sensors are not detectable by other ships because they receive data without emitting tell-tale information about the source of the sensor. For example, thermal sensors detect the presence of heat but do not require any emissions to be made in the process. Objects that give off heat, such as other ships, are detectable by thermal sensors.

Multiple sensor devices are available, including visual, thermal (infrared), radar, lidar, neural activity sensors (NAS) and densitometers. Sensor packages from Basic to Advanced are described on page 21, including which sensors are provided with each package. The functions of each sensor type are described on page 55 of the *Traveller Core Rulebook*. Of the options listed, only active radar/lidar significantly aids detection by other sensors.

In civilised space, ships often run their active sensors to obtain more detailed data about their surroundings. However, there are many instances in which it is wise to maintain a lower profile. Doing so requires careful management of a ship's sensory systems and this is the job of the ship's sensor operator, often referred to as the sensop.

INITIAL DETECTION

Ships use a variety of sensors to collect information about their surroundings. By combining data from multiple sensor devices, a ship's computer generates a composite image of detected objects, giving the sensop and their crew detailed information about the space around them, including what and who is in it. Initial detection by and of a ship depends, in part, upon which sensor systems are running.

When a starship comes out of jump or during in-system transit, their sensors detect hundreds if not thousands of objects, depending on population and traffic in the system. Beyond Distant range (more than 50,000 kilometres), most of these objects simply appear as blips on a display, difficult to differentiate from each

Initial Detection

Factor	DM	Example
TL difference between ships	+1 per higher TL	A TL15 ship receives DM+3 to detect a TL12 ship.
Target running active sensors	+2	Target ship is operating active radar/lidar sensors.
Target running passive sensors only	+0	Target ship is operating visual, heat, EM and other passive sensors only.
Target is operating manoeuvre drive	+1 per Thrust	A target ship applying Thrust 3 provides DM+3 on an opposing ship's sensor check.
Target is operating power plant	+1	Target is operating its power plant at minimum level (basic ship systems) or higher.
Transponder or radio comms	+6	Target ship is running its transponder or radio comms.
Extended sensor array deployed	+2	The ship is equipped with an extended array and it is deployed.
Stealth	-2, -4 or -6	Target ship has stealth coating. See Stealth on page 77 for more information.

other. Those that emit radio waves are assumed to be ships, satellites or space stations. Those that do not might be powered-down ships, planetoids, comets or other objects. Without closer inspection, detailed system charts or communication with other spacecraft in the vicinity, it can be difficult to determine the exact nature of many objects. For all intents and purposes, the knowledge that these ships and other objects are present is all that is needed; however, should one ship need to approach another for boarding or to engage in combat, more precise information is required. To obtain this level of information, the ship's sensop must make an Average (8+) Electronics (sensors) check (1D minutes, EDU), adding DMs listed in the Initial Detection table and DMs for the type of sensors being used, as described under Install Sensors on page 21.

Success indicates that the data collected by the sensop is enough to pinpoint the location of the ship, whereupon the ship's captain can decide whether to allow an approach or engage in space combat. Failure indicates that the location of the ship (or even that it *is* a ship) cannot be accurately determined. Exceptional failure means the object is not detected at all or just assumed to be some inert object such as a planetoid, defunct satellite or space junk. Note that attempting to locate a ship with this level of accuracy requires the use of active sensors.

In civilised space, it is expected that ships run with transponders on at all times. While they are capable of being deactivated temporarily, doing so can result in a heavy fine, boarding or even an attack, depending on the naval presence, government type and Law Level of the system. On the frontier or in systems with an Amber or Red travel code, Travellers are sometimes permitted to operate without transponders under very specific circumstances; for example, wilderness refuelling at a gas giant, landing on a remote moon or other situations in which they might be vulnerable to attack from pirates or other troublemakers.

STEALTHED SHIPS

After initial contact, sensor detection is maintained under most circumstances. However, sensor contact with ships that have stealth may be lost if the range between ships extends by one or more bands during an encounter.

For example, at the start of combat, two ships – one or both of whom has stealth technology – detect each other at Short range but the range extends to Medium during the next Manoeuvre Step. Ships with stealth must be reacquired by the opposing sensop with a new Average (8+) Electronics (sensors) check, adding the following DMs.

Savvy stealth ship captains know how to 'go dark' after distancing themselves from an opponent, shutting down most or all systems that allow them to be detected. This gives the stealthed ship a significant advantage in combat, enabling them to select when to engage an opponent if indeed they want to at all.

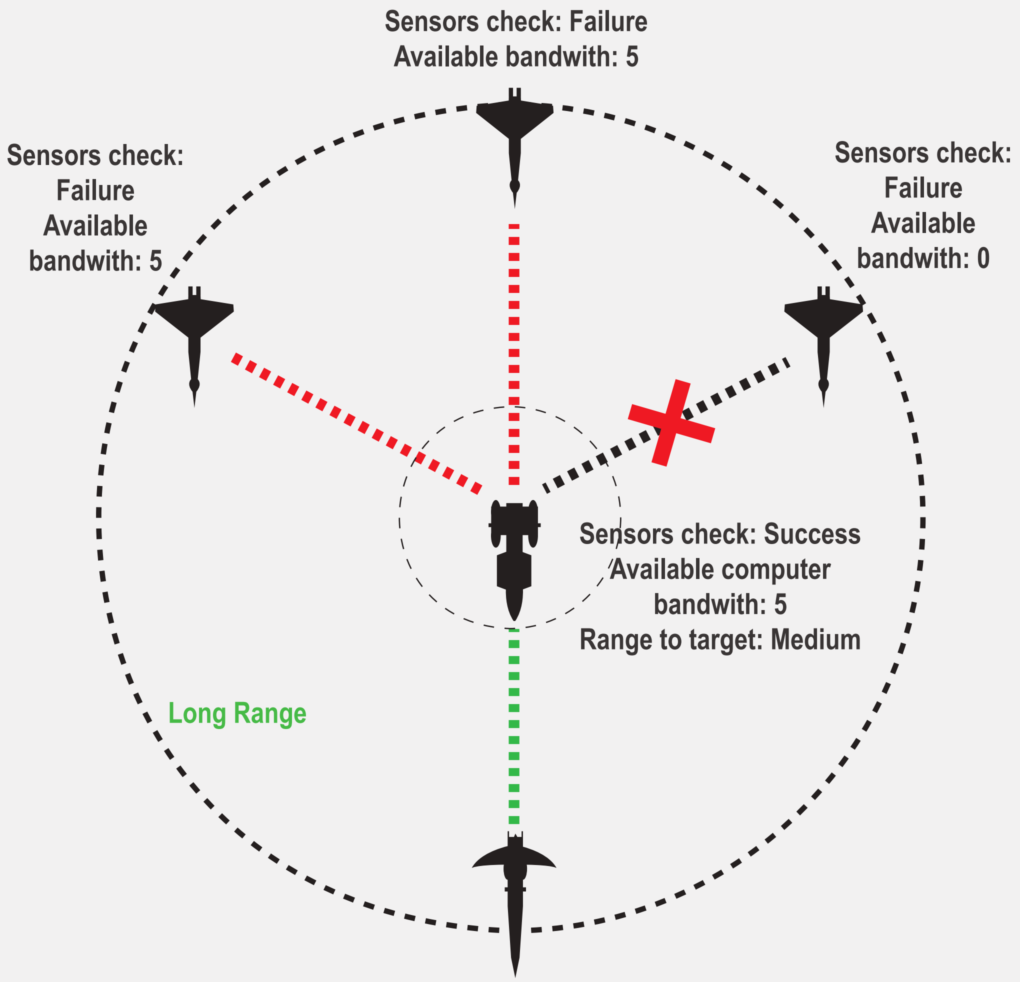
SENSOR HAND-OFFS

If multiple ships are engaged in combat, they can communicate or 'hand-off' sensor data to each other over their comms systems, enabling all ships to have the same data, limited by range and available computer Bandwidth.

For example, a squadron of four patrol vessels, all within Long range of each other, might have different sensor packages, three with Military grade sensors and one with Advanced sensors. If the three ships with Military grade sensors fail their checks but the one with

Stealthed Ships

Factor	DM	Example
Tech Level difference between ships	+1 per higher TL	A TL15 ship receives DM+3 to detect a TL12 ship.
Stealthed target fires weapons	+2	The ship fires laser turrets or other weapons.
Stealthed target has been damaged and emits heat	+1 per Severity	Critical hit damage to the stealthed ship emits a heat signature.
Stealthed target uses active sensors	+2	Sensor locks, electronic warfare or other deliberate use of active sensors.
Stealthed target is operating manoeuvre drive	+1 per Thrust	A target ship applying Thrust 3 provides DM+3 on an opposing ship's sensor check.
Stealthed target uses its transponder or comms	+6	Target ship is running its transponder or radio comms.



In the illustration, the central ship has successfully detected the stealth ship and has 5 Bandwidth free for hand-offs. The other three ships that are pursuing the stealth ship have failed their sensor checks but those with available Bandwidth can receive a sensor hand-off from the central ship. The ship on the right has no available Bandwidth; therefore, it cannot receive a sensor hand-off and does not detect the stealth ship. However, the other two have the available Bandwidth, so they detect the stealth ship and may attack it as normal.

Advanced sensors succeeds, all four ships may have sensor detection of the target ship thanks to their ability to share data.

A hand-off requires one point of available computer Bandwidth from both the host and recipient ship. To add to the example above, the ship with the Advanced sensors has a Computer/15. The ship is using 10 Bandwidth to run an Evade/1 program, leaving it with five points of available Bandwidth. Therefore, the ship can hand-off its sensor data to a maximum of five other ships, provided that each of them also has at least 1 Bandwidth available to receive the data. Ships that receive hand-off sensory data cannot then hand-off that data to additional ships.

Hand-offs have limitations. If one or more of the ships in a hand-off strays beyond Distant range, the connection is lost. This does not mean the ships have lost comms with each other; merely that the range is too great to accurately convey sensor data in real time. In addition, if the target ship makes a successful electronic warfare check against any of the ships in the squadron, that ship loses comms contact with the other ships, breaking the hand-off. In this scenario, the target ship could engage in electronic warfare with the ship that has Advanced sensors, and a successful check breaks its contact with the oter ships in the squadron. Note that electronic warfare does not cause any ships that have established sensor contact with the target on their own to lose that contact. It only breaks hand-off communications between the ships.

Note that computer cores, which are typically used by capital ships, are vastly more powerful, and multiply available Bandwidth points by 10 for this purpose, allowing them to hand-off data to entire squadrons. In addition, ships may obtain Battle Network software to enable them to hand-off sensor data to all allied ships within range. For more information, see The Ship's Computer on page 73.

EXOTIC TECHNOLOGY

The ship design rules covered in previous chapters cover a broad range of technologies, up to around TL15. While technology beyond this is rare in Charted Space, it can exist and in other universes might be common to the extent of ubiquity.

This chapter introduces a range of new technologies that can be used as part of the design process to create some truly awesome and unusual ships. Some of these technologies extend far beyond the Tech Levels that are typically available in the Charted Space universe and some are within those technological boundaries but are not allowed for various reasons. These technologies should be considered optional and may be added to any *Traveller* campaign as desired.

NEW DRIVES

Among the most fundamental technologies a ship uses are its drives: the jump drive, manoeuvre drive and power plant. The drives detailed here can be used as additions or complete replacements to those presented in previous chapters. If they are intended as replacements for any of the standard drive technologies, then a Referee is free to reduce the TL required for a drive by as much as 8–10 levels in order to make them fit into the existing Tech Level structure.

HOP DRIVE

The hop drive is similar in principle to the jump drive, but performs at an order of magnitude higher, enabling hops in the tens of parsecs. Hop drives have the same minimum size, as well as fuel and power consumption, as jump drives of the same rating. Select the desired hop score and use the figure in the Hop Potential table as the percentage of the ship's hull that the hop drive will consume, then add five tons. A hop drive must be a minimum of 10 tons and they cost MCr15 per ton. Much like jump technology, each hop requires approximately one week of travel time. The hop drive first appears at TL17.

In addition to making hops possible, Hop Control software reduces the distance in parsecs – for purposes of calculating DM for Astrogation checks – by 10 rounding up (minimum one). As with Jump Control, the cost of Hop Control software is waived if the ship has a Core computer

Software	MCr	Bandwith
Hop Control/1	1	40
Hop Control/2	2	50
Hop Control/3	3	60
Hop Control/4	4	70
Hop Control/5	5	80
Hop Control/6	6	90
Hop Control/7	7	100
Hop Control/8	8	110
Hop Control/9	9	120

HYPERDRIVE

An alternate method of crossing the vast distances between the stars, the hyperdrive opens a temporary portal into hyperspace which the ship physically flies into. While within hyperspace, the ship uses its conventional manoeuvre drive to travel, although the effect of hyperspace is to greatly magnify its effect in relation to realspace. Once at its destination, the hyperdrive opens a new portal which leads the ship back into realspace.

Hyperdrives cost MCr2 per ton.

Hop Potential

Rating	1	2	3	4	5	6	7	8	9
% of Hull + 5 tons	2.5%	5%	7.5%	10%	12.5%	15%	17.5%	20%	22.5%
Hop TL	17	18	19	20	21	22	23	24	25
Parsecs (with governor)	1–10	1–20	1–30	1–40	1–50	1–60	1–70	1–80	1–90

Hyperdrive Potential

Rating	1	2	3	4	5	6	7	8	9
% of Hull	10%	12%	14%	16%	18%	20%	22%	24%	26%
Hyperdrive TL	17	19	20	21	22	23	24	25	26

Skip Potential

Rating	1	2	3	4	5	6	7	8	9
% of Hull + 5 tons	2.5%	5%	7.5%	10%	12.5%	15%	17.5%	20%	22.5%
Skip TL	20	21	22	23	24	25	26	27	28
Parsecs (with governor)	1–100	1–200	1–300	1–400	1–500	1–600	1–700	1–800	1–900

A hyperdrive consumes no fuel and, while in hyperspace, the spacecraft moves a number of parsecs equal to its Thrust per hour, up to a maximum of the hyperdrive's rating. This is the equivalent distance moved in realspace, and determines where the spacecraft appears once it emerges from hyperspace.

Power Requirements: In order to use the hyperdrive, the ship requires an amount of Power equal to the hyperdrive's total tonnage.

SKIP DRIVE

The skip drive is similar in principle to the hop drive but performs at an order of magnitude higher still, enabling skips in the hundreds of parsecs. Skip drives have the same minimum size, as well as fuel and power consumption, as jump drives of the same rating. Select the desired skip score and use the figure in the Skip Potential table as the percentage of the ship's hull that the skip drive will consume, then add 5 tons. A skip drive must be a minimum of 10 tons and they cost MCr150 per ton. Much like jump technology, each skip requires approximately one week of travel time. The skip drive first appears at TL20.

In addition to making skips possible, Skip Control software reduces the distance in parsecs, for purposes of calculating DM for Astrogation checks, by 100 rounding up (minimum one). As with Jump Control, Skip Control's cost is waived if the ship has a Core computer.

Software	MCr	Bandwith
Skip Control/1	1	40
Skip Control/2	2	50
Skip Control/3	3	60
Skip Control/4	4	70
Skip Control/5	5	80
Skip Control/6	6	90
Skip Control/7	7	100
Skip Control/8	8	110
Skip Control/9	9	120

WARP DRIVE

The warp drive is similar in effect to a hyperdrive, but instead of entering hyperspace it creates a warp 'bubble' around the ship, effectively stretching spacetime. The ship can now travel many times the speed of light but does so in realspace. In every other way, it functions in the same fashion as a hyperdrive.

SPACE FOLDING DRIVE

Using a space folding drive, a ship instantaneously jumps from one point to another. This works just like the standard jump drive on page 15 but there is no weeklong wait in hyperspace. No time whatsoever elapses during the transition from one place to another but the drive must recharge for 24 hours before it can be used again. A space folding drive must be a minimum of 20 tons. Space folding drives cost MCr3 per ton.

Power Requirements: In order to use the space folding drive, the ship requires an amount of Power equal to 50% of the hull's total tonnage multiplied by the space folding drive rating. No fuel is consumed.

TIME DRIVE

This drive manipulates the fabric of time and space around the ship, allowing it to travel through time rather than space. It is capable of moving the ship forward or backward in time, allowing Travellers inside the ability to create all kinds of paradoxes.

Like other drives, it uses a power plant for its function and consumes a certain amount of tonnage. The maximum period of movement possible (hours, days, months, years and so forth) is dependent on the percentage of hull volume the drive uses – the larger the time drive is proportional to the hull it is installed within, the greater amount of time can be travelled in a single jump, as detailed on the Time Drive Potential table.

The time drive can move a ship up to six of the increments listed. So, for example, a time drive-3 could move a ship forward or backward in time up to six hours. The fuel required to do so is equal to:

2.5% of ship's hull x time drive rating.

Time drives cost MCr5 per ton.

Power Requirements: In order to use the time drive, the ship requires an amount of Power equal to 25% of the hull's total tonnage multiplied by the time drive.

Space Folding Potential

Rating	1	2	3	4	5	6	7	8	9
% of Hull	2.5%	5%	7.5%	10%	12.5%	15%	17.5%	20%	22.5%
Space Folding TL	17	18	18	19	19	20	21	22	23

Time Drive Potential

Rating	1	2	3	4	5	6	7	8	9	10
TL	20	20	21	21	22	22	23	23	24	25
% of Hull	5%	8%	11%	14%	17%	20%	23%	26%	29%	32%
Time Increment	Seconds	Minutes	Hours	Days	Weeks	Months	Years	Decades	Centuries	Millennia

NEW WEAPONS

As new technology becomes available or research goes down different paths, a variety of new weapons or new implementations of weapons begin to appear.

QUAD TURRETS

There is a practical limit to how many weapons can be placed within a turret but, at the same time, there are always engineers who like to push the limits on what is considered possible. Quad turrets are rare and not especially efficient but pack a serious punch and have potential for intimidation alone.

Quad turrets provide DM+3 on point defence.

Mount	TL	Power	Tons	Cost
Quad Turret	12	2	1	MCr2

ANTIMATTER SPINAL MOUNT

A massive weapon of truly awesome potential, the antimatter spinal mount uses electromagnetic forces to funnel a stream of antimatter particles to a target, where they react violently to cause devastating damage. While only the most advanced vessels can utilise this weapon, they are true fleet killers when they appear in a system.

PLASMA-PULSE CANNON

Plasma-pulse cannons use bolts or pulses of hydrogen plasma funnelled within an electromagnetic field. Upon striking a target, it vaporises any surface it contacts. While relatively power-hungry, plasma-pulse technology is readily adaptable at any size of weapon and is capable of delivering a series of strikes rapidly.

NEUTRON LASER

An advanced development of the humble beam laser, neutron lasers are large weapons that require bay installations to handle their size but they are true capital ship armaments. Neutron lasers are cannon-sized beam lasers that are stabilised by a neutron flow for greater stability – this greatly enhances their damage potential.

SOLAR PULSE GENERATOR

The solar pulse generator is a highly unusual weapon that is distributed across the hull of an entire ship, using massive amounts of power to generate a pulse that affects all nearby ships, shorting out their systems and disabling them.

A solar pulse generator has capacitors installed, allowing the 2,000 Power required to fire it to be added incrementally over time. However, once it has started charging, it must be fired within 10 rounds or be discharged safely, a process that takes 1D rounds. If this is not done, the generator overloads and inflicts its damage upon its ship while discharging.

When fired, the solar pulse generator automatically damages every ship within range except the firing ship.

SUPER LASER

A term used to describe a wide range of different technological implementations, the result is always the same; a vast and awesomely powerful directed laser beam capable of tearing ships and – when built large enough – even planets apart. While hugely inefficient, both in terms of power and cost, super lasers have no practical limit when it comes to scalability.

TACHYON CANNON

This weapon fires a stream of high-speed tachyons that pass through thick armour without being slowed by it. Molecular bonded armour is immune to this effect and tachyon cannons lose their AP trait when attacking a ship so armoured.

NEW SCREENS

As weapons technology progresses, so too does that of defensive measures. Energy screens, in particular, become more ubiquitous as technology improves.

Turret Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Plasma-pulse Cannon	13	Medium	10	2D	MCr3	Auto 4

Barbette Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Plasma-pulse Cannon	13	Medium	20	3D	MCr6	Auto 4
Tachyon Cannon	14	Long	6	2D	MCr5	AP 10

Small Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Neutron Laser Bay	16	Long	40	7D	MCr18	—
Plasma-pulse Cannon Bay	13	Medium	60	6D	MCr15	Auto 6
Tachyon Cannon Bay	14	Long	10	4D	MCr15	AP 10

Medium Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Neutron Laser Bay	16	Long	60	9D	MCr18	—
Plasma-pulse Cannon Bay	13	Medium	90	8D	MCr30	Auto 8
Tachyon Cannon Bay	14	Long	15	6D	MCr30	AP 15

Large Bay Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Neutron Laser Bay	16	Long	180	12D	MCr100	—
Plasma-pulse Cannon Bay	13	Medium	400	10D	MCr80	Auto 8
Tachyon Cannon Bay	14	Very Long	25	7D	MCr50	AP 15

Spinal Mount Weapons

Weapon	TL	Range	Base Size	Power	Damage	Cost	Max. Size	Traits
Antimatter	21	Long	12,000 tons	+2,500	+12D	+MCr5000	200,000 tons	Radiation
Neutron Laser	16	Very Long	20,000 tons	+6,000	+8D	+MCr25000	No maximum	—
Super Laser	16	Very Long	20,000 tons	+6,000	+14D	+MCr25000	No maximum	—
Tachyon Cannon	14	Long	3,500 tons	+500	+7D	+MCr750	28,000 tons	AP 15

Special Weapons

Weapon	TL	Range	Power	Damage	Cost	Traits
Solar Pulse Generator	18	Short	2,000	5Dx100	MCr25000	Ion

DEFLECTOR SCREENS

These are energy-based screens projected away from a ship to deflect incoming attacks and reduce the damage they cause. Deflector screens mitigate damage from any weapon, reducing its damage by 1D (multiplied by the Effect of the angle screens action).

ENERGY SHIELDS

Seen as the ultimate in defence, energy shields do not require dedicated gunners to ensure their effectiveness, only engineers to feed them power. Energy shields, when activated, form a permanent and invisible bubble around a ship that absorbs incoming energy. So long as the energy they can absorb is not overwhelmed rapidly, the ship is kept safe from harm.

When a hit is scored, determine damage as normal, including any Damage Multiples . Each energy shield installed on a ship forms a 'buffer' of 10 points of damage. All functioning energy shields on board a ship combine to increase the damage they can collectively absorb.

All damage a ship suffers is initially deducted from the energy shields. When the energy shields have had their buffer reduced to zero, all remaining damage is applied to the ship as normal.

Each energy shield regenerates one point in its buffer at the end of every round. A successful Difficult (10+) Engineer (power) check (one round, INT) doubles the rate of recovery for that round.

Improved energy shields contribute 20 points to the energy buffer and regenerate two points at the end of every round. Advanced energy shields contribute 50 points and regenerate five points at the end of every round.

Screen	TL	Power	Tons	Cost
Deflector Screens	10	10	5	MCr5
Energy Shields	14	50	20	MCr25
Improved Energy Shields	16	75	15	MCr35
Advanced Energy Shields	18	100	10	MCr60

WHITE GLOBE GENERATOR

Similar in concept to the black globe generator, this defensive system is far more advanced, projecting a glowing white barrier of energy around a ship that absorbs incoming fire. However, unlike the black globe generator, the white globe generator allows a ship to function normally while it is in use, with no restrictions on sensors, manoeuvres or attacks.

White globe generators are available only at TL20 or above and are extremely rare. They consume 50 tons and, when available, cost at least MCr1000. They require 100 Power.

As the energy of attacks absorbed by the generator is channelled to capacitors, a ship must have sufficient capacity if it is to avoid overloading its systems and explode catastrophically. Fortunately, if a ship possesses a jump drive, it already has a considerable number of capacitors. A jump drive has capacitors equal to 20% of its size in tons. Additional capacitors may be purchased at a cost of MCr3 per ton. Each ton of capacitors absorbs 50 points of damage.

If a ship with a white globe generator absorbs more damage than its capacitors can handle, the ship automatically explodes and is instantly destroyed.

To avoid this, the capacitors can be discharged. For every combat round the white globe generator is switched off, the capacitors discharge an amount of damage equal to 1% of the ship's total tonnage multiplied by 10% of the tonnage of the ship's power plant.

NEW OPTIONS

Advanced systems installed on board a ship can radically alter its capabilities, allowing it to perform beyond the specifications of what is considered 'normal' in the galaxy.

COLLECTORS

These are accumulators, sweeping up exotic particles captured by a canopy and removing the need to carry separate fuel for the jump drive. This charge is released in a single spike to power a jump drive; collectors cannot be used for normal ship operations.

Collectors become available at TL14. They consume 1% of a ship's tonnage multiplied by the maximum jump number its drive is capable of, plus five tons. They cost MCr0.5 per ton.

It takes a week of normal space travel to fully charge an accumulator and accumulators do not work in jump space, in an atmosphere or on a ship expending thrust.

GRAVITY WELL GENERATOR

This complex device creates an artificial although temporary gravity well across a large area of space, making the process of jumping extremely dangerous. It is typically used by navies and system patrol craft to trap pirates and other lawbreakers, stopping them from escaping to jumpspace before they can be boarded or destroyed. Enterprising pirates, however, sometimes use them to stop defenceless merchants from fleeing.

A gravity well generator becomes available at TL16 and costs MCr120. It consumes 100 tons and requires 500 Power to function. It projects a gravity well across 300,000 kilometres with the same effect on jumping ships as being within the 100 diameter limit of a planet or star (see page 157 of the *Traveller Core Rulebook*).

At TL17, a more powerful gravity well generator with greater range becomes available. This version consumes 300 tons and 1,200 Power points. Its gravity well extends 1,200,000 kilometres and costs MCr360.

JUMP FILTERS

An advanced modification inserted between a ship's computer and its sensor suite, jump filters search for very specific traces created by expended fuel and broken jump envelopes in order to track the direction and location of a ship's jump. With detailed analysis, this allows a prediction of which star system a ship has jumped to.

In order to use a jump filter, a ship must be previously detected and its jump witnessed. A Very Difficult (10+) Electronics (sensors) check (1D rounds, INT) enables the operator to determine where the ship has jumped.

Jump filters become available at TL14. They consume no tonnage but require 5 Bandwidth from the ship's computer, 1 Power and cost MCr5.

PSIONIC TECHNOLOGY

The use of psionics can be hated, feared or illegal in many universes. However, the sheer impact psionics can have on any dynamic in space, be it battle or trade, is too great to ignore. High technology is therefore used to degrade or enhance psions in space.

PSIONIC CAPACITOR

Through a combination of exotic matrices and carefully engineered crystalline technologies, the psionic capacitor is an effective artificial storage system for psionic energies, which can be drawn upon by any psion on board the ship.

A psion must succeed at an Average (8+) PSI check (free action) to gain access to the capacitor every time they wish to draw PSI points from it. The psion can then use any amount of PSI points present in the capacitor for any psionic power used in the same round.

A psionic capacitor becomes available at TL18. It costs MCr10 per ton and consumes 10 Power per ton. It can hold a maximum number of PSI points equal to 10 times its tonnage and automatically regenerates one PSI point per ton every hour, so long as sufficient Power is available.

PSION STATEROOM

This stateroom is equipped with psionically calibrated mood-calming environment sensors that promote peace and relaxation. This allows a psion to greatly increase the regeneration of their powers after using them and expending their psionic points.

Psionic Capacitor

A psion stateroom is identical to a normal stateroom in every way but a psion within increases their PSI regeneration rate by +50%.

A psion stateroom becomes available at TL12. It consumes four tons and costs MCr2.

PSIONIC SHIELDING

Incorporating exotic metals as a matrix embedded within the hull of a ship can make it extremely difficult for clairvoyants and telepaths to use their powers within shielded areas. While this technology is difficult to employ and of limited effect, any edge can be worthwhile if a captain wishes to protect themselves from psions.

Psions using Clairvoyance or Telepathy powers suffer a penalty within this ship or upon its occupants. However, the shielding is most effective on small vessels and larger vessels tend to develop 'holes' that a cunning psion can exploit.

Ships above 500 tons receive no DM. The penalty for Clairvoyance and Telepathy powers is DM-4 for ships of 300 tons or less and DM-2 for ships of 500 tons or less. Ships of less than 100 tons are completely impenetrable.

Psionic shielding becomes available at TL12. It consumes 1% of the total tonnage of the ship and costs Cr500000 per ton.

At TL16, advanced psionic shielding becomes available. This consumes no tonnage and costs MCr1 per 100 tons, or part of, of the ship being shielded.

CREW ROLES

A qualified crew with a broad range of skills is required to operate a ship. This chapter describes each of the roles that are listed in the Determine Crew step (page 22) of spacecraft design. Additional roles and crew positions might be required on specialised ships, such as those used by the military, but the descriptions below should provide a wider understanding of the responsibilities of the core crew positions on most ships.

ADMINISTRATOR

The administrator role is only present on large spacecraft, 2,000 tons or more for commercial ships and 1,000 tons or more for military craft. Such ships are rarely operated by private owners and are usually corporate or government property. As valuable investments, they are overseen by administrative staff, some of whom might be high-ranking company or military officers. An administrator is sometimes even in command of the ship or the mission it is on. In such cases, in addition to the crew, the chief admin usually has a staff to whom they delegate the myriad tasks that must be performed to keep the ship running and its mission on track. The administrative staff include accountants, clerks, pursers, personnel management (also called sophont resources), crew advocacy, liaison officers, quartermasters, librarians, yeomen and others.

Administrators keep track of the ship's fuel, supplies, cargo, work schedules and oversee the progress of a voyage, deployment or mission, noting completed objectives and milestones that are achieved. Freighters and military craft have a job to do and the administrative staff are there to ensure it gets done as efficiently as possible by taking care of all the little details. The operational crew are present to get the ship from point A to point B. Admins are there to ensure that the ship's mission is accomplished.

The best admins are sticklers for process. 'If you play by the rules, you win the game,' is a common admin's refrain. Captains accustomed to uninhibited command sometimes bristle at the presence of one or more administrators but the larger the ship – and the larger the administrative staff – the more they are tolerated and, quite often, appreciated for their contributions.

The role of a ship's administrator does not stop at its bulkhead walls. An admin on a freighter, scout or exploratory trader must know the laws, customs, conventions and culture of each and every world on its route. Should a problem arise when attempting to dock the ship at a highport, getting approval to send shuttles planetside or having cargo lots processed through customs, administrators are present to smooth things over.

The best administrators know the rules at each starport as well or better than local officials. Likewise, admins on military ships are experts at procurement. The military often runs on a shoestring budget and quality admins know how to get the most out of their Credits and where the best supply scrounging is to be had. Savvy procurement officers have a tendency to collect the highest bonuses and get promoted more often. Cutting through red tape and keeping the voyage or mission going is one of their primary functions.

Some administrators also serve as a ship's attorney. In the Third Imperium, the law safeguards free trade and assures safe travel between star systems. Many Imperial laws are left deliberately vague but the best space lawyers have memorised a great deal of legal precedents to lean upon should adjudication be required.

THE ADMIN'S JOB IS NEVER DONE

Common task checks for the ship's admin:

Check the ship's logs to make sure nothing is amiss: Routine (6+) Admin check (2D minutes, INT).

Negotiate a cheaper docking fee: Average (8+) Admin or Broker check (INT or SOC). Adjust the docking fee by Effect x 10%.

Recall local disembarkation customs: Difficult (10+) Admin or Advocate check (1D rounds, EDU). Success gives the admin time to inform crew before they leave the ship. Failure results in an offence to the locals and future SOC-oriented tasks are made at DM-2.

Obtain clearance to land at a downport on a high Law Level world: Difficult (10+) Admin or Advocate check (1D hours, SOC).

THE PURSER

On all types of ships, the purser is responsible for taking care of its finances. While they are routinely part of a ship's administrative staff, pursers may be found on ships as small as 200-ton tramp traders. On a merchant starship, the purser might well have the most important role of all. In fact, the captain sometimes doubles as the purser on smaller merchant spacecraft. A merchant purser handles all freight, cargo, mail and passenger transactions at the various ports that it visits. The key skill for such transactions is Broker but many other skills come into play as well, depending on the scope of the purser's job.

Travelling from one star system to the next, the worlds that a starship crew encounters can be vastly different from each other. One world might feature a freewheeling semi-anarchy while the next might be governed by an authoritarian dictator or oligarchy. Advocate skill helps the purser to navigate the hazardous legal landscape of each world. Knowing legal particulars can also help prevent Travellers from inadvertently bringing contraband onto a world. Just because a certain cargo is legal in one system does not mean that it will be in the next.

The Admin skill can help a purser cut through procedural red tape. For an independent free trader, it is essential that the ship keeps moving. A ship's operating costs or mortgage do not pay themselves and time is money. The cadence for tramp traders is to jump into system, work their way in from the 100-diameter limit to the starport, establish contact with a local brokerage, engage in trade and then depart the system. This typically takes 1-2 weeks, enabling most traders to make two jumps per month, sometimes three. In the process, Travellers can find themselves denied docking privileges, hung up in customs or at the mercy of a corrupt or supercilious port authority agent. A competent administrator knows how to get through hold-ups like these. Many ships have dedicated administrators to perform these tasks but some degree of knowledge on the part of the purser enables them to present a united front.

Pursers with the Diplomat skill are politically savvy, using their intellects or social connections to set up the best deals possible. Persuade skill might work as a substitute for Diplomat depending on the circumstances.

Once they manage to get through any bureaucratic unpleasantness, the purser uses their Broker, Carouse or Streetwise skill to find passengers, cargo, freight and mail to transport. Refer to Trade on page 238 of the *Traveller Core Rulebook* for more information on finding suppliers and brokering deals. Making contact with an individual broker or brokerage house, meeting with them to discuss business, making deals and both delivering and receiving goods makes for a busy week or more. On a small ship, there is too much to do for a single person so the purser often involves other members of the crew to get things done. On a larger ship, they might have an administrative staff to work with but, even then, the purser will tap the expertise of other crew members to help get the work done no matter what their specialisations are. Pursers often work in close concert with the ship's stewards, especially with regards to the passengers.

On a larger ship, such as a Leviathan merchant cruiser, Al Morai Type MK transport or *Galika Megula*-class megafreighter, the purser takes on a more expansive role and must have a greater understanding of finance and economics. Making trade deals, establishing new freight runs and forging corporate relationships requires more expertise.

The purser must be an expert improviser. This goes without saying on exploratory ventures into the frontiers and wild outlands beyond the safe borders of an interstellar polity. However, even on tried-and-true trade routes, pursers must learn to expect the unexpected. Information only travels at the speed of jump and circumstances can change from one port of call to the next.

On military craft, the purser's job is quite different. Usually only assigned to capital ships (more than 5,000 tons), the purser and their staff are responsible for keeping the ship supplied. There is a common misconception that destroyers, cruisers and battleships – which are expensive – have unlimited resources. The reality is quite the opposite. Keeping a military ship properly supplied is always a challenge and there are opposed forces at work. A well-supplied ship is one with high morale. While a ship's captain strives to keep their ship amply supplied at all times, they have a limited budget to work with. The purser is the manager of these funds and their career

THE PURSER (CONTINUED)

advancement largely depends on their ability to be frugal but also to keep the ship appropriately supplied. On long deployments, it can be quite a challenge to maintain the ship's supplies, spares and stores, especially if the ship's mission takes them into foreign or uncharted territory. Pursers must become resourceful to do their jobs well under such circumstances but those who manage to tread the fine line of staying under budget without adversely affecting morale tend to rise through the ranks rapidly. For more information, see Supplies, Spares and Stores on page 53, and refer to the *Naval Campaigns Handbook* from the *Element Class Cruisers* set.

Make sure the speculative cargo goods the purser bought are of the expected quality. Opposed: Difficult (10+) Admin or Broker check (INT) versus a Difficult (10+) Deception check (INT).

Convince port authority agents that the illegal goods the ship is carrying are legal and there is no need to examine them further: Very Difficult (12+) Admin or Advocate check (1D minutes, SOC). Success means the goods are not inspected. Failure indicates they are impounded and the Travellers are fined for carrying contraband or smuggled goods. Exceptional failure means the Travellers are jailed for 2D days and then fined 2D x Cr10000 before being released. This task can be proceeded by a Difficult (10+) Advocate check (2D hours, EDU) in a task chain in order to cite or fabricate legal precedents that might reduce fines or jail sentences. Add the Task Chain DM.

ASTROGATOR

Astrogators are only required on jump-capable spacecraft. The astrogator is responsible for keeping track of where the Travellers' starship is and where it is going. Jump drives enable Travellers to get from one star system to another and the astrogator's main job is to make sure that they get to their destination safely. The course is plotted with the aid of a starship's astrogation computer but the astrogator must make key decisions regarding the departure point, jump distance and estimated arrival point. In addition, qualified astrogators understand astronomy and jumpspace physics well enough to calculate the basic course without the aid of a computer. This takes more time but any astrogator worth their salt can plot a course with minimal technology if necessary.

Calculating a jump is relatively easy for one-parsec trips but becomes considerably more difficult as the distance increases. Simply put, ships with longer jump ranges must have more experienced astrogators or they risk missing their target, or worse, misjumping. Astrogators are also put to the test when they have to plot early jumps. Starships must typically reach a distance of 100 diameters from any object before engaging the jump drive. However, there are times when Travellers might want to get out of a star system quickly. Jumping before reaching the 100-diameter limit puts a great deal of stress on the jump drive and greatly increases the possibility of a misjump. An astrogator's accurate course becomes all the more important under such circumstances.

Astrogators determine when a ship will come out of jump when plotting their course. If the ship making the jump is part of a fleet, the ships' astrogators can share data in order to synchronise jump exits. Synchronised jumps are important in military operations and situations in which one does not want to come out of jump alone, such as when travelling in a convoy. Even if one's 'fleet' is a couple of armed traders and a scout ship, the synchronised arrival of a decent-sized group might be enough to deter pirates or other troublemakers.

Plotting courses between stars is the essential job of an astrogator but an overlooked aspect of the astrogator's responsibilities occurs in normal space between jumps. When in normal space, the astrogator may work in tight concert with the ship's pilot and sensor operator to track where they are, where they are going and what planets, asteroids, orbital starports and other objects are in their vicinity.

When assisting the pilot in normal space, an astrogator has three primary tools: the astrogation computer, sensor array data and an interface with engineering. The astrogation computer interacts with the jump drive when engaging in interstellar travel. Sensor array data provides information about their surroundings in normal space. When coming out of jumpspace, the first question the astrogator wants answered is 'Where am I?'. The astrogation computer analyses data from the sensor arrays, library program, recorded data from the flight computer and data gleaned from local satellite arrays and starport control, when available. The engineering interface enables the astrogator to submit their course to the ship's engineer who tunes, prepares and engages the jump drive to make the journey.

When one is in the Regina system and planning on a jump to Yori – a mere two parsecs away – the astrogator has access to an immense amount of data that is used to ascertain where the ship is and where it is going with pinpoint accuracy. There is less data for backwater systems, whose available resources might be slim and none but the starship's computer and sensor array can be used to perform a basic system survey within hours, giving the astrogator what is needed.

Once a spacecraft is in flight, the astrogator sees a display of 'known objects', things that are expected to be present in the current star system. These include orbital starports, satellite arrays, near-planet objects such as asteroids and comets and other things for which there is a historical record of existence and location. Sensor array data provides a plethora of information, which is fed to the astrogation computer that then guesses in advance what the astrogator might want to do next, providing scenarios for a series of potential courses.

When flying 'nap-of-the-earth' to a destination on the other side of the planet, astrogation data provides an array of choices for the pilot to make. Weather patterns are obtained from local data sources, if any, or predictions based on the meteorology of the local region or that which the computer observed during planetfall. This is where Astrogation gives way to the Navigation skill. Once within nap-of-the-earth range, Navigation is used to accurately get Travellers to their destination.

When taking the ship into orbit, the astrogation computer checks in with the local starport, if present. The computer checks the starport's data and places all known objects in cache, not displaying them until after their presence is confirmed by sensors. Once the sensors detect new ships or other objects, the computer updates the local traffic display and presents it graphically to the astrogator. Known or expected objects have a greater amount of data available. New objects are presented with whatever is known: transponder IDs, power signatures, basic size and shape coalesce into a presentation that evolves as the sensors and other data sources obtain more information.

Jump drives are primarily tuned for travel between gravity wells, deftly staying outside of the 100-diameter limits of stars, planets and other objects. Jump courses rely upon those gravity wells as points of contact. Making jumps into deep space – empty hexes on a starmap – far from any discernible gravity wells, is a risky undertaking. Experienced astrogators learn how to do it by triangulating: they anchor their desired destination point to the last visited gravity well and known far-off gravity wells that are one or more parsecs away. The calculations for deep space jump exits are complicated and missteps can be hazardous. If the numbers are wrong, the ship may exit jump in the wrong spot, making it difficult to recalibrate and make the next jump.

The astrogator role is the only one that most species in Charted Space do not automate. Astrogation is more than just starmaps and complicated mathematical calculations. It is an art form.

CAPTAIN

The captain of a ship is its leading officer, assigned to command for a specified period of time or indefinitely, until relieved or otherwise dispossessed of that command. The captain executes this duty based upon rules or guidelines such as the interstellar laws of the region in which the ship operates. In the Charted Space universe, this would usually be Imperial law. The captain must also observe the rules imposed by the owner of the ship whether that be the navy, a merchant line, the scout service or even a single patron or owner aboard. The ship itself may also have rules and regulations. For example, if the ship is a naval destroyer, the captain must carry out the role assigned to such a craft, being careful not to exceed that role but also making sure that the ship performs its duties to the fullest.

Being a captain does not necessarily mean that one knows how to carry out each and every role on a ship. For example, the captain need not be a qualified pilot, astrogator, gunner or engineer to do the job. The captain must only know the intended mission of the ship and command the crew to perform that mission. Most captains rise to their rank by showing competence in one or more crew roles but there are exceptions. The captain of a large merchant vessel might be an expert broker, administrator or other functionary who understands the mission of the ship and is therefore qualified for command. On a military ship, the captain might understand the concepts of naval tactics but could have little to no experience in any of the crew positions. The captain of a pirate vessel might simply be the toughest person standing, fending off rivals who would take the captaincy by force, if possible. The captain might also simply be the owner aboard, the person who has majority or outright ownership of the vessel. In some cases, the captain of a ship is simply born to the role, as is the case for an Imperial noble, Aslan clan leader or member of the Zhodani *Zhobrdievl*.

On smaller ships, the captain usually doubles as a member of the crew. While pilots and astrogators are the most common captains, there are no restrictions that prevent any member of the crew from serving in the role. Interstellar custom dictates that only ships of 100 tons or more have a captain. The commanding officer on a small craft is called a skipper.

ENGINEER

An engineer's work is never done. Engineers are responsible for the maintenance and repair of the ship's drives, power and life-support systems. When all systems are operating at peak performance, the engineer's job is simple: Monitor the ship's functions and, in the case of starships, engage the jump drive when called upon to do so. Ships have a complex array of equipment with hundreds of working components. Keeping them all operating is difficult and demanding.

Life-support systems are perhaps the least glamourous but most critical. The primary job of life support is to maintain environmental integrity. A ship without air cannot support its crew for any significant length of time. All engineers understand the basic principles of life support engineering: maintain atmospheric pressure and oxygen levels, filter and absorb carbon dioxide, maintain gravitic systems (g-compensation and artificial gravity), manage waste and water supply, and provide for early detection and suppression of fires. A ship's g-compensation system is designed to counter the amount of thrust the ship has. If the ship's maximum thrust is somehow exceeded, the g-compensation may be pushed to counter higher g-forces but only for a limited amount of time and at the risk of damage to the system.

A journeyman's knowledge of life-support systems and due diligence is all one needs to keep them running properly. Advanced training enables an engineer to apply fine control to the various life-support systems and to repair them quickly and efficiently. Fine control includes limiting atmospheric pressure and oxygen to specific compartments, altering the output of the artificial gravity system and increasing g-compensation, if necessary.

The ship's drive systems include manoeuvre and jump drives, with the former providing locomotion in normal space and the latter enabling the ship to travel interstellar distances in jumpspace. The function of both drive systems is described in Ship Design on page 15. The manoeuvre-drive system includes separate components for orientation and thrust with interfaces to the power plant and ship's computer. In addition, there is some overlap with the life-support system, which uses related gravitic technology for artificial gravity and g-compensation.

The jump-drive draws power from the ship's power plant into energy sinks, which accumulate and distribute the enormous amount of energy required to create the jump bubble that protects the ship during its transit through jumpspace. Perhaps the most complex component of the drive is its jump governor, which manages the distance of a jump, limited by the drive's jump rating. The jump drive requires a great deal of care and maintenance. It is a complicated system whose function is only partially understood. Engineers understand how each of the jump drive's individual components work but jumpspace and transit through it is a mysterious phenomenon, somewhat taken for granted given the lack of complete understanding about how it works.

There are several different types of power systems available but most interstellar spacecraft use fusion power plants, ranging from TL8–15, with greater efficiency as technology increases. Higher technology plants are more costly but provide more power per ton and greater reliability.

Interfaces to the ship's main engineering systems are located in the drive room and the bridge but on smaller, less-sophisticated ships, the latter may simply be a terminal without a dedicated workstation. Most engineers do their work in the engine room where the drives and power plant are co-located on most designs.

While most of an engineer's job is performed on the interior of a ship, there are components on the exterior that fall under their purview as well. First is the hull itself, which can be viewed as the outermost layer of the life-support system. The hull is also a separate system, one upon which other features can be attached. Turrets (if present) and sensors are partially located on the exterior with their interfaces and much of their electronics accessible from inside of the ship; Mechanic and Electronics skill is required for their repair and maintenance, respectively. Engineers are also responsible for the fuel scoops, vents that take in raw gas or water that can be 'cracked' for their hydrogen content and used as fuel. These, of course, lead to one of the largest systems on any ship: the fuel tanks.

Engineers must be prepared to go anywhere within or on their ship. While some exterior maintenance and repairs can be done remotely with drones, most engineers like to take a hands-on approach, which requires competence in the use of vacc suits.

Maintenance activities are the bane of the engineer's existence. Refer to Running Costs and Maintenance in the Spacecraft Operations section of the *Traveller Core Rulebook* for more information. While this section describes the concept of monthly maintenance, the activities involved can actually be carried out throughout the month.

However, the engineer need not be thought of as a slave to the ship, forced to stay behind during every adventure because they need to change out the fuel lines or recalibrate the jump governor. Think of maintenance tasks as a laundry list that must be addressed on a monthly basis. The engineer can take care of most or all of them all at once or spread them out throughout the month as they see fit.

Engineers see the ship a lot differently than its crew or passengers. They are fully aware of the machines that enable it to do what it does while other crewmembers are often content with the illusion that 'things just work'. The crew may be excused for their lack of intimate knowledge about each and every component but those in the engineering profession are often astounded by how little most people know or understand about ships' systems. Engineers have a much greater understanding of the inherent dangers of flying in a compact vacuum-sealed container with a fusion reactor inside, surrounded by tons of explosive liquid-hydrogen fuel. Having just a little knowledge can be dangerous, so most engineers are content to keep their craft to themselves and only impart those bits of information that the captain and crew need to know.

GUNNER

Gunners operate the weaponry and defences that ships use in space combat. They have the glorious role of firing ship weapons at enemy forces, wreaking damage upon them with everything from the 'brilliant lances' of laser weaponry and the potentially massive destruction of a missile salvo, to particle and meson bays and spinal mounts that can destroy other capital ships with a single well-placed shot.

Over the immense distances involved in space combat, it is extremely challenging to hit a target – especially one that is actively evading and moving at a rate of hundreds of kilometres per second – and it requires more than just technology to do so. The successful targeting and hitting of enemy ships, thousands of kilometres distant, is made possible by advanced sensors and computers, which aid in the detection and selection of targets and prediction of where they might be but it also requires an understanding of psychology and a talent for reviewing analytics quickly and efficiently. Gunners must make split-second decisions based on what is ultimately incomplete information. A talented gunner gets a feel for their opponents, based on experience and recognisable tendencies. In this regard, gunnery is more than just pulling a trigger or pressing a launch button – it is also an art form.

Gunnery has four specialisations: turrets, ortillery, screens and capital weapons. Turret, barbette and small-bay gunners are the 'gunslingers' of the profession, solitary operators who rely more upon quick reflexes and individual decision-making than other gunnery roles. In addition, laser turret gunners have the secondary role of point defence, switching their targeting computers from enemy spacecraft to incoming missiles and torpedoes. Point-defence gunnery requires a steady hand and steely eyed focus. Missiles and torpedoes accelerate at astounding speed, usually twice that of the fastest ship one is likely to face and if they manage to detonate on target, they can utterly devastate a ship. Sandcaster gunners are the unsung heroes of the profession, using an array of probabilities and psycho-tendency data to deploy laser-mitigating chaff into the space between one's ship and the enemy. Lasers are the most common weaponry on small ships and accurate sand deployment can be the difference between life and death.

Ortillery gunners operate orbital strike and bombardment weapons, designed to target terrestrial sites, whether they be small, strategic targets or large ones such as population centres. Ortillery differs from other gunnery specialisations in that it must penetrate mediums other than vacuum. Ortillery gunners have a complex array of calculations to make based on atmospheric density, geographic features and distance to ground zero, often under tight time constraints. Approaching and attacking enemy worlds can expose ships to the dangers posed by close-orbit and airspace control command (COACC) spacecraft and atmospheric fighter craft and drones, as well as surface-to-space missiles and other anti-spacecraft weaponry, some of which might be protected in deep-site installations that are difficult to penetrate. Ortillery gunners usually take a clinical approach to

their work. The knowledge that civilians may be killed by ortillery can have adverse psychological effects if their gunners do not learn to disassociate actions from consequences caused.

Screen gunners are perhaps the most overlooked in the profession but are extremely important in fleet actions. Screens mitigate the damage of nuclear and meson weapons, both of which can devastate unprotected ships.

Investment in screens is expensive. Without dedicating vast resources that could be applied elsewhere, screens cannot be expected to completely safeguard a ship. However, good screen gunners can extend a ship's lifespan, preventing it from suffering major damage deep into a battle, thereby allowing its guns to further damage the enemy. Fleet combat can be a war of attrition and it is not always the most powerfully armed fleet but the one that lasts the longest that prevails. Capital ships with sufficient screen arrays and experienced gunners have proven this maxim time and again.

Capital gunners operate bay and spinal mount weapons. All but small bays employ crews of multiple gunners that operate in concert to arm, target and fire their weapons. Bay weapon crews are usually selected for their ability to cooperate and function well as a team. Competition between the various bay crews of a ship is not unheard of, with prizes and awards going to those who perform the best in drills and battles. Placing wagers on their targeting prowess is strictly forbidden by most naval commanders but that does not prevent it from happening. Officers will often look the other way provided that morale remains strong and no awards for 'worst performance' are given. Spinal mount crews are enormous, sometimes including hundreds of gunners. These crews have their own subcultures and bureaucracies with a commanding gunnery officer and 'trigger person' at the top of the hierarchy. Spinal weapon commanding officers are likened to symphony conductors, who must keep a close eye on every member of their team, ensuring that they do their jobs promptly and well. Spinal crews operate complex machinery with a wide array of parts and functions, so some degree of specialisation is inevitable but most have broad cross training. In battle, portions of a spinal mount crew can become casualties and the next person up must be prepared to take critical jobs vacated by fallen comrades.

Bay weapon team leaders are often cross-trained in Leadership (0 or 1) and Mechanic. Spinal mount commanding officers are cross-trained in Leadership (1+), Tactics (naval) and Admin, while officers of a more technical bent receive training in Admin, Electronics (computers or sensors) and Mechanic. The more complex the weapon, the more important the Admin skill becomes. Military capital ships have budget constraints and every department works hard to obtain the resources they need from a limited pool. The gunnery department is no different and having the Admin skill helps to make sure the maintenance of the ship's guns remains a top priority.

Gunners – especially those who operate turrets, barbettes and small bays – are sometimes a source of derision due to the mistaken belief that they have considerable down time. In fact, the best gunners are constantly working at their craft, analysing past battles and recordings, and simulations of other battles, not just famous ones, but routine encounters likely to resemble what the gunners themselves might one day face. Screen and capital gunners are not exempt from such critiques; organised maintenance, training and drilling is a full-time job for these specialisations.

Gunnery control can be centralised at the bridge or dispersed throughout a ship. Most capital ships have dispersed control to prevent a lucky shot by enemy spacecraft from eliminating a ship's offensive capabilities.

Even a 'decapitated' ship with its bridge destroyed can still be lethal as long as its guns keep firing. Some ships have a centralised model with the commander and key trigger personnel on the bridge. Design efficiencies and the preferences of the admiralty dictate which approach is taken. Captains who came up in the ranks of the gunnery department usually prefer a strictly distributed approach while those who came up in flight, technical or the line often prefer to have their key gunners in close physical proximity.

THE GUNNER'S CONTROL PANEL

Gunners, especially those on ships with the holographic display option, benefit from a highly customised control panel setup. Gunners arrange their preferences, including a complete array of targets, hit probabilities, damage estimates for hits they have made and – when closing in for the kill – a target-assist heads-up display of potential called shot locations.

The ship's computer automatically uses the comms to transmit firing platform suggestions to the pilot but the exchange can be much more lively than just an automated feed of data. Once the ship is in dogfight range, the display goes wild, showing more data than the typical gunner can handle. Gunners with neural links might be more accustomed to the rapid flow of targeting data and dangers that the ship faces during this phase. However, many veteran gunners eschew such technology, preferring instead to rely upon instincts and fast reflexes.

MAINTENANCE

The larger the ship, the more widespread and extensive its basic systems are. Small ships can run with the aid of one or two engineers but commercial ships of 1,000 tons or more and military ships of 500 tons or more require additional personnel to keep everything running properly. A ship may be viewed as an organism; the larger the organism, the more complex its systems. On smaller ships, an engineer with some mechanical skills can take care of both jobs but on larger ships, maintenance staff must be on hand to keep all systems healthy when engineers are otherwise engaged operating the ship's core technology – manoeuvre and jump drives, power plants and life support systems.

Mechanic is the primary skill of maintenance workers but those with qualifications in the various electronics specialisations or those with a basic understanding of engineering have superior value. Maintenance workers with this level of cross-training are often called 'drivehands' in ship parlance. The title is more esteemed in some circles and can even be used to negotiate for a marginally higher salary. Drivehands are expected to be troubleshooters who can assist the engineering staff or substitute for them in a pinch. Due to their more limited expertise, drivehand repairs are often temporary and might require more permanent attention by engineers at a later time.

Ship maintenance staff must be creative and know how to use their skills to 'jury rig' a faulty system. While engineers are busy with the complicated tasks of keeping the ship's high-tech drives running, maintenance workers must replace lighting systems, clean air ventilation shafts, get sticky iris valves to open and close properly, and keep the cargo crane rolling smoothly between the gantries in the hold. Maintenance is a blue-collar job that pays less, often calls for more overtime and lacks the glamour and perceived value that engineers have but quality maintenance staff are worth their weight in gold. During space combat, maintenance staff must often put themselves in harm's way to get a critical system back online after it sustains battle damage. Hazard duty requires some level of expertise with vacc suits.

In addition to ship hardware, maintenance staff are expected to keep all subordinate craft well maintained, too. This includes ship's boats, fighter craft, air/rafts, ATVs and any other vehicles docked within the mother ship.

MARINES AND SHIP'S TROOPS

The terms marines and ship's troops are sometimes used interchangeably. While the two share some of the same duties, there are significant differences in scope.

Ship's troops are exactly that: troops on a ship. The primary role of the ship's troop is to defend their ship. When the ship is docked to another, their duties may extend to the attached ship, whether they are sent inside as a security detachment, part of an inspection or a boarding party.

Marines are often used for the same duties but are also on hand for standard marine functions such as orbital drops and raiding. Marines also serve in lift-infantry units but this requires a special type of ship, usually a capital ship that is a member of an AssaultRon (assault squadron). Lift infantry usually include a vehicular component that requires a capital ship to transport it.

Ship's troops and marines must perform a significant amount of training to perform their roles, most of which is done off-ship. Weapons training requires a firing range and while ships sometimes have training facilities for this – simulators or even a designated area in the cargo hold

– most such training is done offsite. Likewise for small-unit tactics, which are extremely important. Honing one's skills in the arts of defending or assaulting a ship can be done aboard the ship to which a marine or ship's troop is assigned but it creates a significant amount of chaos. It is difficult for other crew members to get their jobs done when armed and armoured soldiers are running through the hallways, simulating breach defence, ship-to-ship assault and other drills.

When not actively performing their duties, marines and ship's troops can be idle, which might cause problems. For example, during jump, there is little for them to do. The obvious solution would be to store them in low berths but due to the dangers and the time it takes to recover after being revived, this can be impractical. For this reason, low berth storage is typically reserved for mercenaries and other soldiers who merely need transportation from one world to the next. Even then, the practice is suspect. When one is being transported for active duty, whether in service to the Imperial Army or a mercenary unit, it does not pay to be groggy before being inserted into a potential war zone or other environment in which alertness is required. Idleness among ship's troops and marines is usually remedied with technical studies and drills that require more thinking and less action. This does not always go over well with some of the rough-and-tumble sorts who take these roles but is attempted nonetheless.

Ship's troops and marines are usually accommodated in double-occupancy rooms or a barracks. Each requires a similar investment in space and life support costs but a barracks environment can foster a superior team mentality which, as every soldier knows, adds to performance and survivability in the field of battle.

If the ship's troops or marines are members of a military service and they are serving on a small ship, such as a close escort or patrol corvette, then they are typically organised into a light platoon, even if they are little more than a squad or section in size. A lieutenant is usually in charge of the unit, although a sergeant will suffice. As ships and the troop contingents get larger, they might resemble traditional military units in organisation with ranks up to and including a brigadier or general in charge.

For more about ship's troops and marines and the kinds of operations they perform, see Boarding Actions on page 125. Included are recommendations for the types of weapons and armour used.

MEDIC

The ship's medic might go by other names, including medical officer, ship's doctor or in the case of a navy ship, naval surgeon.

One medic per 120 crew is required on all ships. While there is no formal requirement, one medic is recommended per medical bay, enabling each to provide care for up to three patients if necessary.

A ship's medic is on hand to address all the typical needs of patients: providing medication and treatment for the sick and wounded, ensuring the physical and mental well-being of all crew, providing first aid treatments and operating any medical technology aboard the ship such as a medical bay or autodoc. If the ship has low berths, medics are expected to put low passengers into cryogenic sleep and revive them when they reach their destinations. Expert medics are adept at this task but journeyman medics usually perform revivals slowly to reduce injuries and death.

The medic is also expected to maintain and secure the supply of any drugs used by the crew. Ideally these are contained in a secure facility in a medical bay but other devices are available, enabling drug storage in a ship's locker or other storage space.

Travelling medics are likely to see a broad range of pathogens over the course of their careers, especially those who travel to uncharted or rarely visited worlds. While there are extensive catalogues of disease-causing microbes kept at most major hubs, medics encounter surprises. Unknown or mutated viruses and bacteria often thwart vaccines and other treatments, and it requires advanced medical technology to keep up with the changes. Microbes are not the only biohazard encountered on alien worlds. There are many fauna and flora that can cause health problems as well. Venoms, acids, spores and vicious bites are sometimes suffered by Travellers who wander the wild outback of the frontier. The ship's medic must be prepared to deal with such occurrences, not to mention those incurred from weaponry, high-tech or otherwise. In space travel, there is also the constant danger of radiation exposure. The universe can be a dangerous place and the ship's medic never knows what sorts of hazards their crew might encounter and what treatments will be required.

Medics on a military ship might have the opportunity to go into the field to perform surgery or support military units during deployments. These can be hazardous assignments and medics with cross-training in terrestrial skills such as Navigation, Recon and Survival are preferred.

While there is no formal requirement for ships with fewer than 120 crew and passengers to hire a medic, having someone on hand with the Medic skill is recommended. Ships carrying middle passengers should have at least one crew member with Medic 1+ and if transporting high passengers, there should be one with Medic 2+.

OFFICER

Whether a ship is civilian or military, the larger its crew, the more officers are required to manage them and to take on important projects during its missions.

Commercial ships require one officer per 20 crew and military ships require one officer for every 10 crew. Common departments for both civilian and military ships are command, flight, engineering, small craft operations and medical, if a ship's doctor is present.

On a civilian ship, the mission might be commercial, political, diplomatic or many others. On a merchant ship, officers are assigned to manage finances and interstellar economics. A political or diplomatic mission might have an administrative wing or a security detachment to protect heads of state or emissaries on foreign worlds. The possibilities are endless but the need for a command structure is the same. When there is a mission to be accomplished, some form of organisational hierarchy is required and leaders are required to run it.

Military ships have additional departments that are not present on a civilian ship: marine or ship's troops command, and master-at-arms to name a few. Military missions typically require a greater degree of precision and adherence to rules and regulations; hence the requirement for two times as many officers as on civilian ships.

On a ship with one or only a few officers, the primary responsibility of the officer corps is to check in on each of the departments of the ship, make sure things are in good working order and to ensure the safety and well-being of all crew. At a minimum, three officers are necessary to establish a regular watch at a given position, stationed at the bridge or patrolling the deck and reviewing the various departments. Officers report their findings to the captain and fellow officers or, if all is well, simply sign off on the schedule, ensuring that all departments and crew are performing to expectations.

As an officer corps grows, regular watches are established so that critical departments always have an officer on hand to manage its systems and crew. At a minimum, watches should be established on the bridge, the deck (all accessible compartments and corridors on the ship) and in the engineering (sometimes called technical operations) department. As the officer corps expands with a larger crew, management of the cargo hold, gunnery (if present), stewards, administration and any additional departments are incorporated into the watch schedule. Functions such as bridge, deck and engineering are expected to have an officer on watch at all times while some other departments might only have officers on hand during nominal daytime hours.

On smaller ships, officers might be called upon for different assignments when their ship is in port but on larger ships, watches are maintained as normal unless the ship is secure or additional officers have been brought aboard from the associated agency (for example: military bases, government agencies or corporate offices) to help manage the ship.

Officers are typically the most well-informed crew members on the ship up to and including the captain, who relies upon the officers to stay updated. When not on duty, officers review mission objectives and make sure that they are prepared for whatever events are to occur after the ship reaches its destination. On commercial ships, this might be preparing for docking, trade activities or bringing esteemed guests aboard. On military ships this can be anything from preparing to show the flag at a friendly port, to drilling with allied ships to full battle stations and wartime missions if they are entering a conflict zone.

PILOT

The pilot of a spacecraft has the glamourous job of flying the ship in normal space and within planetary atmospheres if the ship is designed for it. The pilot can often seem to be the one in command of the ship – they are *flying* it, after all – but this need not be the case. On small ships, the pilot has a lot of say in what happens. When it comes to making tight manoeuvres, there is no time to make decisions by committee. On larger ships, there is a captain making the call but even on the mightiest capital ship, the pilot must often make split-second decisions that affect the safety and wellbeing of the entire crew, not to mention the integrity of the ship itself. Pilot skill is divided into three categories: small craft, spacecraft and capital ships. Knowledge of one imparts partial knowledge of the others but the experience of flying each type of ship is quite different.

Those with Pilot (small craft) fly ships below 100 tons, from five-ton light fighters to large passenger shuttles. While there are clearly differences among small craft, the principles are similar. Gravitic technology and g-compensation makes handling them just about the same. A small fighter has similar performance to a shuttle in vacuum. One of the key differences for a small-craft pilot is the ability to fly the ship into and out of small spaces. Fighters are launched a number of ways, including simply detaching from a docking clamp to being fired out of a launch tube. Docking small craft with other ships or flying them onto a recovery deck requires a light touch by the pilot. If one were to liken piloting to painting, larger ships use big, broad strokes while small craft require minute, delicate ones, quick flicks of the wrist on the throttle, control wheel or holographic controls.

Small craft perform far differently in atmosphere than larger ships. Almost all small craft are streamlined, making them capable of atmospheric landings. Many are designed to dock with larger ships and therefore serve as interface craft to highports and downports, leaving their mother ships in close orbit. Because of their small size and configuration, small craft are quite nimble in atmosphere. The addition of aerofins greatly aids this performance but most do not use them.

Another aspect of flying small craft, especially fighters and other armed ships, is that the pilot is often called upon to serve as the gunner as well. Most armed small craft have fixed mount weapons on Firmpoints instead of a turret weapon on a Hardpoint. These weapons require that pilots adjust their facing before using the weapon. During combat, such manoeuvres are assumed to take place during a single combat round and are incorporated as part of any Pilot and Gunner checks the pilot makes, although Pilot and Gunner checks do. Fortunately, most actions taken by pilots and gunners are in separate steps of the space combat sequence, making it possible for a pilot-gunner to do the job alone. The Manoeuvre, Attack and Actions steps do not share actions by pilot and gunner; however, in the Reaction step, a pilot-gunner must choose between evasive action (pilot) and point defence (gunner).

Mid- to large-sized ships with small craft in docking spaces or hangars usually appoint specialised pilots for the starship and small craft roles. Not only does this ensure superior performance in their assigned roles but it also allows for cross-training should one type of pilot be required to fill the role of the other. Inter-career competition between the two specialisations is common with starship pilots lording it over the ‘subordinate’ small craft pilots, who in turn denigrate their alleged superiors by pointing out that flying an ‘oversized brick’ lacks the skill or panache required of ‘real pilots’ like themselves. Common parlance refers to starship pilots as ‘space truckers’ with small craft pilots as ‘flyboys’ (or ‘flygirls’ as the case may be).

Pilot (spacecraft) uses many of the same skills possessed by small-craft pilots but there are more things to be concerned about. While it might take a light touch to fly a shuttle, dexterity is valuable to starship pilots as well. Most small craft are used as interface vehicles and do not have accommodations for long, in-system flights. This task falls upon starships which, in addition to flying to and from jump point, must also travel between the various planetary bodies of a system when required. While large and capital ships often use shuttles to skim for fuel from gas giants, the vast majority of wilderness refuelling is performed by starships. Skimming for fuel is a potentially hazardous task, one which subpar pilots should avoid.

A starship is more than just a hull fitted with manoeuvre drives and a small power plant. Starships almost invariably have an assigned role whether they be traders, scouts, yachts, escorts, corvettes or other types of ship. As such, they carry components particular to their assigned role. Traders and even more so subsidised merchants are sometimes disparaged as ‘spaceborne storage closets’, which does their pilots little justice. Such ships minimise drive size in order to maximise cargo space, giving the pilot little to work with should greater range or power be required. Their pilots must make do with what they have, requiring creativity and savvy.

While not all starships are streamlined, and therefore designed to enter atmosphere, some are and doing so is a far greater challenge than for small craft. Even streamlined starships face the challenge of their greater girth and heft when performing manoeuvres and landings, especially on worlds with high gravity and thin atmospheres. The challenge of knowing where every compartment, turret, wing, fin and nacelle juts out of the ship requires greater forethought when performing complex manoeuvres and landings. Landing partially streamlined ships is even more difficult and not recommended for the journeyman pilot.

Virtually all starships in the Charted Space universe use manoeuvre drives, whose primary components are thruster plates and g-compensators. The first provide reactionless thrust and the second nullify its effects on crew and passengers contained within the hull. Some ships have auxiliary reaction drives, used either as a backup or to support the manoeuvre drive with added thrust on the cheap. Using these on a starship requires careful consideration by the pilot, especially when civilian passengers are aboard. Most spacers are not accustomed to dealing with g-forces, having been spoiled by g-compensation for the vast majority of their time under thrust. All pilots, however, have been taught how to handle the effects of high-g as part of their training. G-compensation might be taken for granted but one cannot obtain certification as a pilot without being taught how to operate without it. Unlike a small-craft pilot, the pilot of a starship is more often tasked with the conveyance of an entire crew and passengers. Moving the ship means moving everyone and this is never far from the pilot's mind.

When in jumpspace, there is little for pilots to do. This gives them an opportunity to relax, brush up on their skills in simulations and work on cross-training skills. Before coming out of jump, most pilots do their homework in preparation for their new location. Coming out of jump is not unlike an extended teleportation. While one expects to emerge 100 diameters from any planetary bodies, there are a great many variables to be prepared for. In the Imperium, the space between worlds is patrolled by the Imperial Navy and subject to Imperial law. Individual planets have their own laws and customs. The ship's pilot should be prepared for the differences.

More than any other role aboard ship, the pilot is a nexus for interaction with other crew positions. The pilot puts the ship in position for the astrogator's jump plot, relies upon the ship's engineer to keep the drives and power plant in good working order, positions the ship to establish an optimal firing platform for the gunners and works closely with the sensor operator to collect data about their surroundings. While a ship's captain may be likened to a conductor, the pilot plays the central instrument of the orchestra.

If flying a starship can be considered complex, then piloting a capital ship is on an entirely different level. The Pilot (capital ships) skill is reserved for pilots of the largest ships in Charted Space, ranging from 5,000 tons to gargantuan dreadnoughts and megafreighters in the multi-100,000-ton range. Thruster and g-compensation technology make manoeuvring such ships only a shade different than much smaller ships but their sheer size and breadth require careful consideration for every move they make.

Moving a capital ship is like moving a small mountain. Capital ship pilots have a greater understanding of the limits of thruster plates than those who fly smaller ships. While fully functioning thruster plates provide maximum thrust in one direction, pilots can get approximately 25% thrust capacity in lateral directions and 10% in reverse. Pilots of smaller ships rely upon these aspects of thruster technology only for finesse manoeuvres but the capital ship pilot lives by them. Directional adjustments and turnaround manoeuvres are much smoother when the pilot applies lateral thrust during the transition.

Another aspect of capital ship piloting that often goes unheralded is the need for greater situational awareness. When in normal space, capital ships are often a nexus of activity, with numerous small craft and starships flying in close proximity. The launching of shuttles, fighters and other small craft added to visiting spacecraft from the local starport or other ships in the fleet make the capital ship a veritable beehive of activity. The pilot must be acutely aware of every ship and other object in their vicinity lest there be an accident. Capital ships are akin to giants who must take caution lest they crush the smaller beings around them.

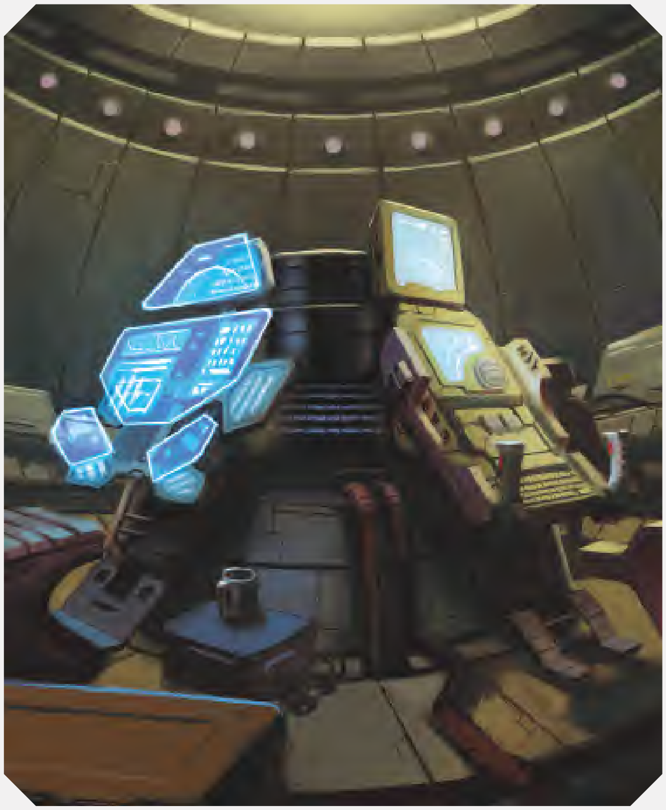
Capital ships are rarely streamlined and therefore not designed to enter atmospheres. As such, The primary objective of the capital-ship pilot is to get the enormous spacecraft into position for its duties, whether that be launching cargo or fuel shuttles, or assembling into formation with a naval squadron. Naval manoeuvres are covered in more detail in *Element Class Cruisers* and *The Third Imperium* but suffice it to say that each type of naval capital ship, whether it be a cruiser, fleet carrier, assault carrier, battleship, dreadnought or any of the other classes, each has specific and general roles to fill that require unique training.

In combat, the capital ship pilot's job is to provide firing platforms for the gunners. A ship's weapons are distributed along multiple sides of its hull (starboard, port, dorsal, ventral, fore and aft), so this requires movement by the ship to face all guns upon a desired target over a brief interval (one combat round). If there is a single target, the pilot applies lateral thrust, first displaying one face, firing, then displaying each of the others and allowing for the weapons to fire after each shift. If the ship is armed with a spinal mount, it may fire this weapon at any time during its facing adjustments but must pause to target it beforehand. Should the capital ship be in battle with multiple targets, hence delivering fire in three dimensions against several opponents, the facing adjustments can be even more complex, requiring greater skill and finesse by the pilot.

THE PILOT'S CONTROL PANEL

Pilot control panels vary from ship-to-ship. At the lower end, flight control systems are completely mechanical, including a hands-on throttle-and-stick that enables the pilot to pitch, yaw and roll the ship. Configurable buttons on the stick enable the pilot to lock the current motion of the spacecraft, return it to default (straight forward) and an abort button that returns to the last setting. Holographic controls feature the same instruments but are tailored to the individual pilot. For example, some pilots do not use a holographic joystick but instead some other virtual tool to manoeuvre the ship.

Video or holographic displays vary from ship-to-ship. Some pilots only run a few screens to prevent from having too many distractions but the standard displays that every pilot uses includes a feed from the astrogation computer, a sensor array display that provides a survey of near-space objects along, drive and power plant status and the current thrust being applied by the ship. Busier panels feature graphical elements that display distance to jump point, current power usage, hull integrity, a fuel gauge, weapon optimisation options and 3D maps to key destinations such as a highport or downport.



Most pilots have customised displays for various scenarios with separate jump point transit, in-system travel, space combat and docking configurations at the ready. On ships with holographic controls, the pilot can sweep from one to the next with the wave of a hand.

Capital ship pilots have an immensely more complicated set of displays that they must prioritise. A fleet monitor display keeps track of their position both within a squadron and in the fleet to which the squadron is assigned.

During a fleet battle, this becomes of great importance if losses begin to pile up. A ship that remains intact after several of their squadron are disabled or destroyed, may be reassigned. The pilot uses the fleet monitor to acquire their newly assigned 'battle squadron', to which they must then relocate and join per the fleet admiral's orders. These manoeuvres can be fraught with danger and call upon the pilot's skill and situational awareness. There are many moving parts to a fleet in battle and deftly inserting one's ship into a new element requires skill and flexibility as the pilot makes a balletic entry into a new squadron or fleet, possibly amid a raging battle.

In combat, the facing display becomes of paramount importance, as the pilot adjusts the ship's facing multiple times to ensure that all gunners are given an opportunity to fire. The display can be thought of as a game console of sorts, in which the pilot's job is to ensure that gunners in every facing have an opportunity to fire over a given interval.

SENSOR OPERATOR (SENSOP)

The sensor operator, or 'sensop', position is extremely important, especially on ships that require accurate information about what – and who – is in space around them. Ships that travel into dangerous systems where there are pirates or enemy warships need their sensors to give them detailed information about their environments.

On a small ship, the sensop role is sometimes assigned to an individual but may also be a part-time duty executed by one or more members of the crew. Should the ship find itself in combat, a dedicated sensop is recommended. There are too many tasks for it to be a part-time job when one's ship is being fired upon. The first of these tasks, unfortunately, can occur before the crew of a ship even knows that the sensop was needed.

Enemy ships can gain surprise on an unwitting ship that does not have an assigned sensop dutifully minding their station. When a ship comes out of jump, approaches a starport, world or gas giant with the intention of skimming for fuel, there are a great many unknowns. Depending on the quality of the sensor array, a ship's passive sensors should paint a picture of its surroundings, depicting planets, planetoids, large heat- or radiation-emitting objects and any ships with their transponders on or those using active sensors. However, ships actively maintaining a low profile – stealthed ships or those running on low power and using only passive sensors – might not be detected unless the sensop is actively looking for them. Under the right circumstances, a ship can gain surprise on an opponent and fire upon them before their presence has even been detected.

Cautious use of available sensors can be played out as a game of 'cat and mouse' where powered-down ships skulk about, virtually undetected until they reveal themselves with a tell-tale sign: use of active sensors, transponder, manoeuvre drives or firing a weapon, just to name a few.

Once the battle has been joined, the sensop's role expands, especially against difficult-to-detect ships. If a sensop makes a successful Average (8+) Electronics (sensors) check, adjusted by Tech Level and other DMs, the profile and approximate location of an opposing ship is maintained throughout combat with a few exceptions. Sensory contact with ships that have emissions absorption grids or stealth coatings can be lost whenever they manoeuvre into a new range band. For example, if a stealth ship is detected, but it uses its superior thrust to travel from Short to Medium range, the sensop on the opposing ship must reobtain the ship's sensory signature.

During combat, the sensop may also obtain sensor locks (making the opposing ship easier to hit with weapons), engage in electronic warfare to jam enemy communications or break jams that have been imposed on one's comms system. Electronic warfare can also be used to prematurely detonate or misdirect incoming missile salvos. The sensop sometimes faces hard choices when only one of the above activities can be conducted during specific phases of combat. Having multiple sensor stations or a capital ship bridge remedies this but even the most grandiose bridge has its sensory limitations.

Under more peaceful circumstances, a sensop might be employed with the task of examining sensor data to gain more information about near-space objects. Detailed scans of rogue planetoids or comets, salvageable ships or abandoned space stations can give the crew of a ship critical information before they approach. Refer to page 160 of the *Traveller Core Rulebook* for detailed information about what each sensor array has in its arsenal and the range and accuracy of its instruments. Most ships have only Civilian or Military Grade sensors, limiting them to lidar, radar and possibly jammers but Improved and Advanced sensor arrays include technology such as densitometers and neural activity sensors, which can greatly enhance the data. A good sensop can give a group of Travellers a great deal of information about what – or even *who* – is present on an asteroid they want to mine for precious ores or an old wreck they want to salvage.

STEWARD

A ship's steward is responsible for the care and feeding of its crew and passengers, and the cleaning and maintenance of their accommodations.

On a typical merchant spacecraft, the steward must divide their time to appropriately service passengers of various levels. High passage is the equivalent of a luxury cruise or flight in first class, including a comfortable, well-appointed and meticulously maintained stateroom – potentially of the high or luxury designation, if available – with single occupancy, high-quality and delicious food provided in three square meals and staff present to wait on hand and foot. High passengers also lease one ton of cargo space in the ship's hold. One level of Steward is required per 10 high passengers.

Middle passage is standard class. Middle passengers enjoy single-occupancy staterooms but the décor and maintenance is more pedestrian and room service might be provided on a bi-daily or less frequent schedule. Perhaps a single meal is provided per day with other meals available via self-service. Middle passengers lease 100 kilograms of cargo space. One level of Steward is required per 100 middle passengers.

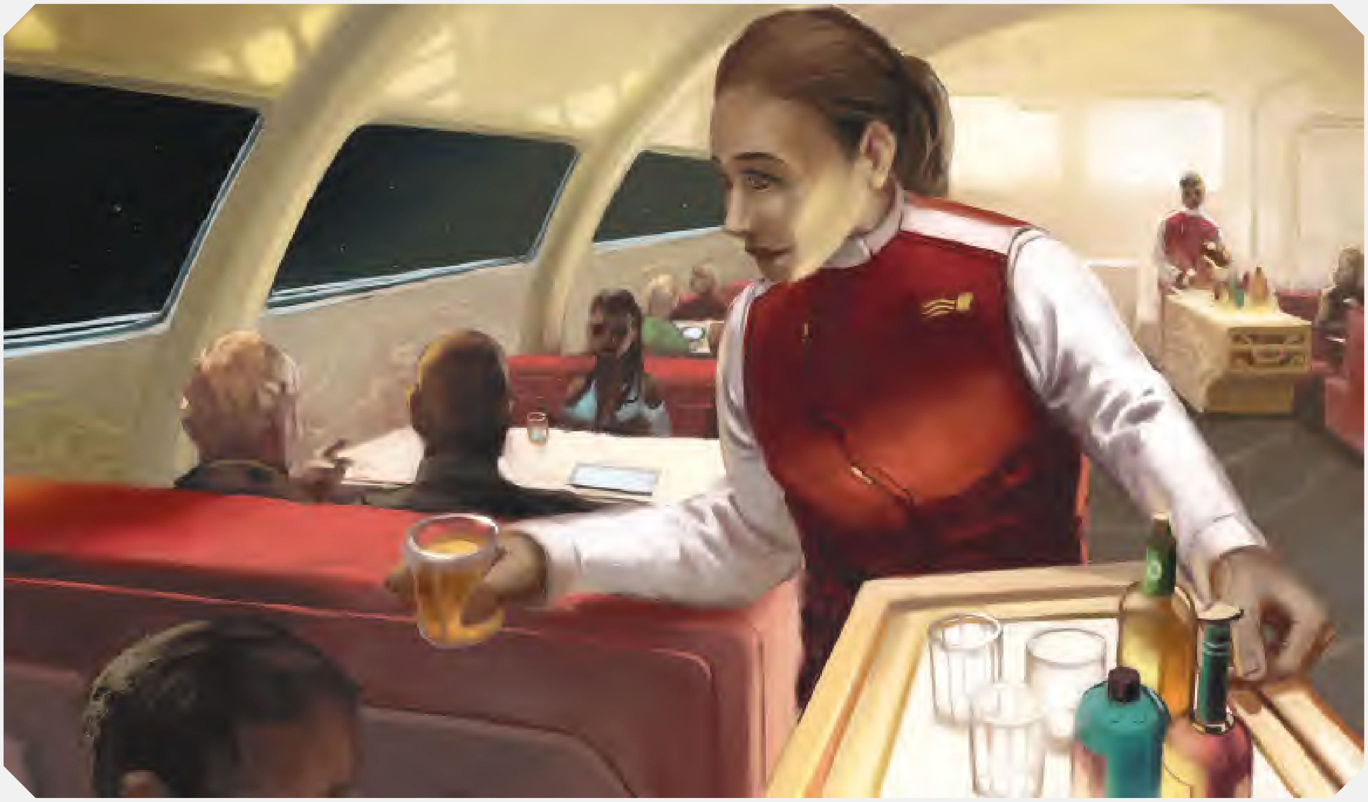
Basic passage varies in quality. At best, passengers can expect double occupancy in a stateroom with minimal attention from the ship's steward. Limited access to stores is granted but passengers at this level are expected to provide for themselves. If possible, basic passengers are segregated from high and middle passengers. In cases where space is not available in the accommodations, basic passengers may be assigned a cot in the cargo hold or another available space. Basic passengers are allotted 10 kilograms of space.

Low passage entails being frozen in a cryogenic low berth, which occasionally results in the injury, illness or death of the passenger. Low passengers receive 10 kilograms of cargo space and receive little attention from the steward other than an occasional check-in or response to an automated alert. Stewards with Medic skill might be called upon to place low passengers in their low berths and revive them at the end of their journey, but this responsibility goes to the ship's medic if one is present.

On a passenger-carrying starship, the steward is the busiest member of the crew during jump. While many crew members have little to do during this time, the steward is actively caring for and engaging with the passengers. Stewards with additional skills, such as Art (performer or instrument), Carouse and Diplomat may be called upon to entertain high and middle passengers, enhancing their experience and garnering a good reputation for the ship. Stewards with Medic or Science (psychology) can provide medical care or even therapy for passengers if requested.

For many passengers, the steward is their sole point of contact among the crew. Most trader ships have dedicated passenger sections to ensure the security of the ship and passengers are rarely allowed to wander outside of their assigned boundaries. However, jumps are a week long and some voyages require multiple jumps. The long period of time sequestered aboard a ship can make passengers a bit stir crazy after a while, giving them symptoms of 'space fatigue'. Tours of the ship and chances to meet the captain and crew can serve as a welcome remedy for the monotony of space travel.

As the old saying goes, one must spend money to make money. Stewards proud of their ship's reputation often spend time at ports of call seeking quality ingredients for cuisine and wine and spirits for their passengers. Such a high degree of care and concern rarely goes unnoticed by passengers, who will highly rate the ship, its steward and by extension its crew, giving the ship a superior reputation and enhancing its ability to find passengers in the future. For stewards who spend Cr1000 or more per high passenger, give the ship's purser DM+1 when seeking passengers as described in the *Traveller Core Rulebook*. Also consider that stewards who go to such great lengths often collect generous tips from their high and middle passengers.



CREATING DECK PLANS

Traveller has a long and proud history of not only bringing ships of every shape and description into galaxies beyond counting but also providing deck plans. Deck plans work on so many levels, from simply allowing Travellers to visualise where everything in a ship is likely to be (and provide endless arguments over who gets which stateroom!), to being used as a tactical map during boarding actions where every bulkhead and iris valve can become an important objective as ruthless invaders forge their way into the most vital areas of a ship.

In short, whenever you design a new ship in *High Guard*, it is always worth creating a deck plan to go with it.

Designing a deck plan can seem a daunting task at first, as if it were some sort of secret knowledge passed on only between clans of highly specialised naval architects. However, as this chapter demonstrates, it is nothing of the sort and even the most artistically challenged, armed with nothing but graph paper and a pencil, can quickly produce convincing deck plans suitable for play.

VITAL POINTS TO REMEMBER

- All components that consume tonnage should be represented on the deck plan with the exception of Armour, Reinforced Bulkheads and Hull.
- Remember that ships can have more than one deck.
- Ships with more than one deck require access to each deck, either through hatches in the floor/ ceiling or lifts.
- If a deck or other large area of a ship contains nothing but fuel, there is usually no need to put it on the deck plan. However, you must remember it is there when sketching out the exterior of the ship.

AND BEAR IN MIND...

- Ammunition storage should be located near its weapon system. After all, when that forward torpedo bay runs out of ammunition, do you really want to run back to the rear ammunition store and somehow lug a two-and-a-half-ton torpedo up to the front of the ship before you can fire again?
- Anything that needs access to the outside (airlocks, vessels carried on board, escape pods, re-entry capsules, launch tubes, recovery hangars, probe drones and so forth) can gain that access from above or below, not just the side.
- Screens could be considered to be integrated throughout the hull and not appear on the deck plan or, alternatively, they may be located in one centralised area.
- Common areas vary, depending on the ship and its role but a ratio of perhaps one square for every two staterooms is a good start.
- Not all the tonnage allocated to a stateroom necessarily goes to the stateroom itself; some can be used for corridors and similar spaces.
- Staterooms contain freshers but you may want to locate some additional ones in different areas of the ship, including as part of common areas.
- Try to minimise excess corridor space as much as you can. Ship architects are going to squeeze as much space as possible into other areas such as cargo. If the ship has space enough to have, say, a single corridor that only leads to a fresher, that space can be better utilised elsewhere (such as cargo).
- Take advantage of the options available in digital tools if you are using any, such as Grid (used to help determine the size of areas), Snap and Alignment (can help with the placement of items), Copy/ Paste or Symbol Libraries (handy for common items such as drives, staterooms and so forth) and Replication/Duplication (for quickly placing multiples of an item).

CREATING A DECK PLAN

So, now we will go through a step-by-step guide on how to construct a deck plan. We are going to put together a 200-ton far trader.

STEP ONE

Sketch a general impression of the exterior shape of the ship. This will give you an idea for the design of the interior deck plan.

STEP TWO

Check the overall tonnage of the ship. Each ton is usually represented by two squares on a deck plan (very large ships may use a different scale to produce deck plans that will fit on a page). You can vary this by up to +/- 10% as spacecraft differ in the amount of space consumed by corridors, lifts, computer systems, life support, machinery and other items not included in the overall design system.

STEP THREE

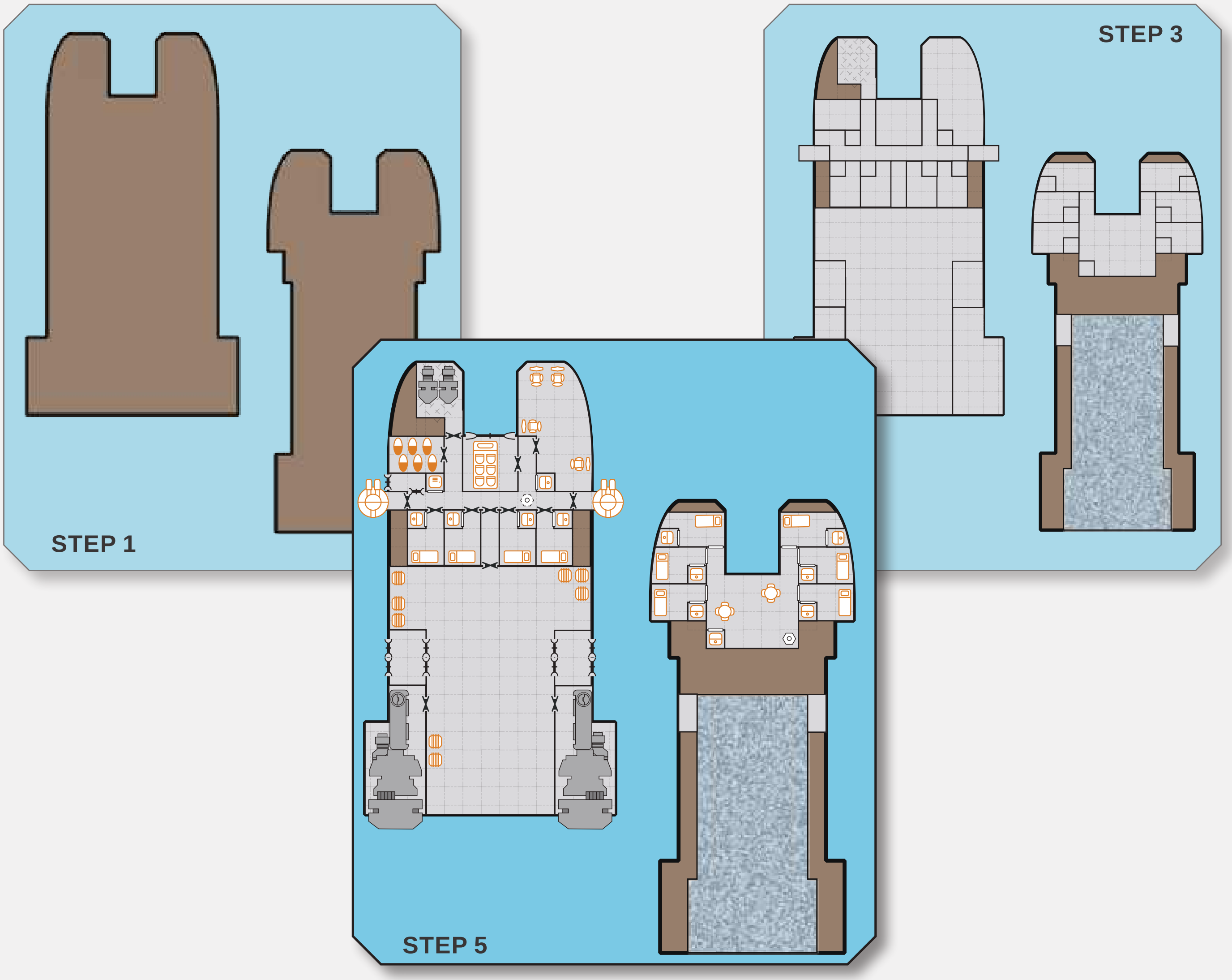
Note that the tonnage of the components dictates how many squares are needed on the deck plan. Start with the power plant, jump drive and manoeuvre drive; each ton on all components requires two squares on the deck plan (so one square equals a half ton).

STEP FOUR

Staterooms typically use six squares, despite them being four tons each – it is assumed that the extra tonnage goes into corridors and access areas.

STEP FIVE

Once you have located all the components that consume tonnage on the deck plan, you are ready to go! It helps if you label each component, especially if you have not used symbols to represent them. Now you are ready to take to the space lanes and use your deck plan in its first boarding action!



FIGHTERS

The popular image of the space fighter pilot is of a maverick, care-free hotshot, who bucks authority to complete the mission. The reality is altogether more professional and while the real strength of any interstellar navy rests on its cruisers and battleships, fighter squadrons are an important supporting element for any fleet.

This chapter presents rules that allow a Referee to bring fighters to the fore of a campaign, extending both the capabilities of fleets and the role of the fighter pilot in adventures.

For the purposes of these rules, a fighter is generally considered to be an armed small craft of no more than 50 tons and at least Thrust 5. However, the Referee might find it useful to extend this definition to cover additional craft. For example, a 'torpedo boat' might be a 95-ton, Thrust 4 spacecraft but still have a place within the fighter family.

SQUADRONS

Fighters rarely travel alone and are commonly flown in pairs (a lead and a wingman) for mutual protection and support. In larger conflicts, these pairs are combined into larger groups – officially, these might be called sections, flights, squadrons or wings but, for the purposes of *Traveller*, the term squadron is used for any cohesive group of fighters.

Fighter squadrons can be organised into groups to lighten the burden on a Referee during a game, treating several fighters as a single unit for the purposes of movement and attacks – in effect, a squadron is treated in the same way as a single ship and may use the Ship Record Sheet found on page 106.

A squadron can be created from any number of fighters that are within Adjacent or Close range of each other (about 10 kilometres), are all able to communicate with one another and, of course, willing to co-operate and be led towards a common goal.

Note that individual fighters can join or leave the squadron at any time, although this forces the Referee or Travellers to recalculate the capabilities of the squadron as shown below.

Also, be aware that these squadron rules are intended for use with a maximum of perhaps 12 fighters. For larger fighter squadrons or complete fighter wings, see Fleet Battles on Page 105.

HULL POINTS

Total the Hull points for every fighter in the squadron – this becomes the total Hull score for the entire squadron. However, while large ships can absorb some damage before suffering adverse effects, fighters are a lot more fragile, typically built for performance rather than durability. The Referee should divide the total Hull points by the number of fighters in the squadron. Every time the squadron loses this many Hull points, a random fighter within the squadron is destroyed. A squadron also loses a random fighter every time it suffers a critical hit – there is no need to roll for the effects of the critical hit, simply remove a fighter.

PERFORMANCE

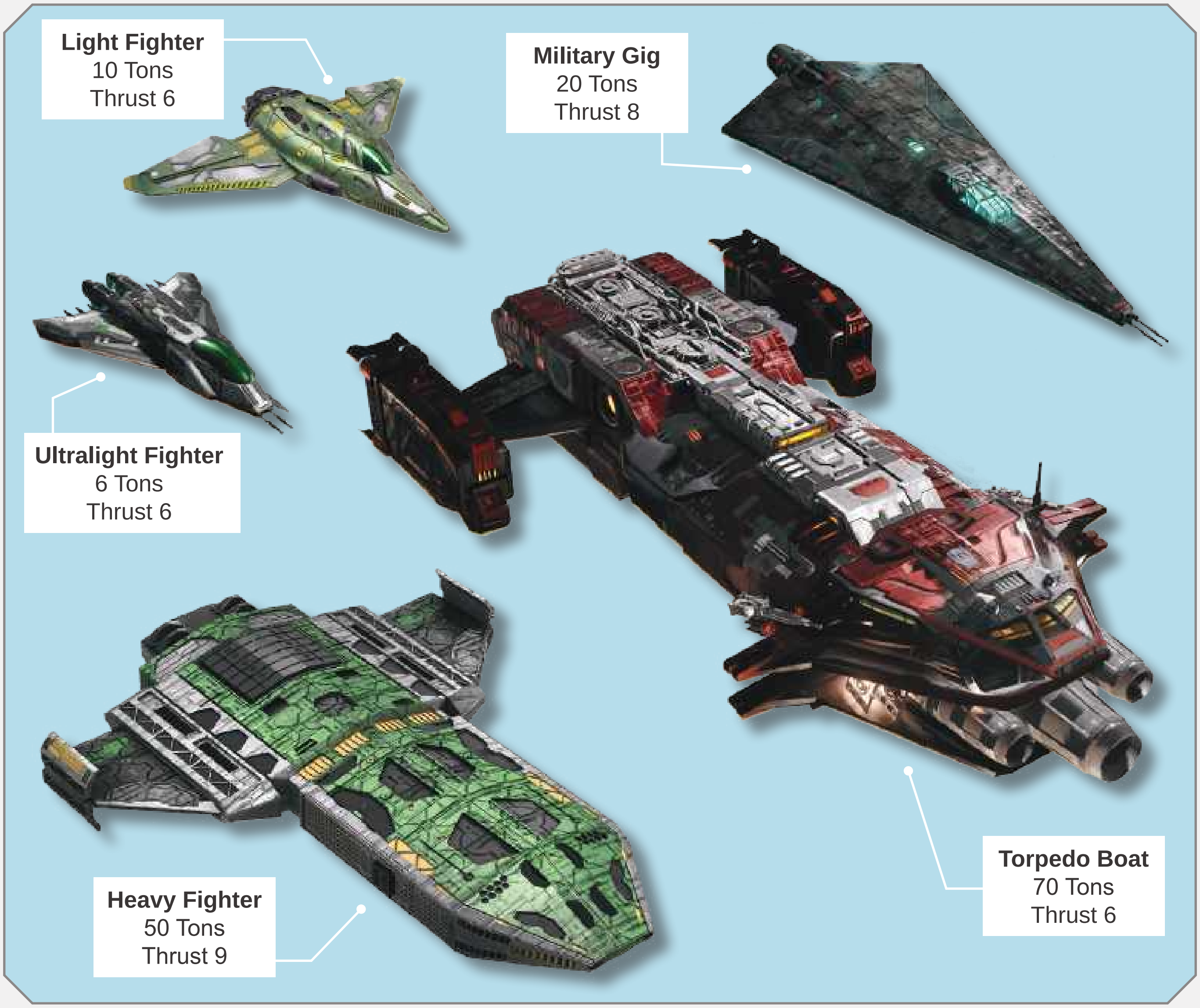
While most squadrons will be comprised of the same model of fighter, there is no reason why this need be the case. Indeed, there are stirring tales of ragged bands of rebels gathering every high-performance small craft they can find to form ad hoc squadrons to fight a larger aggressor and even fully-equipped navies might find it beneficial to form mixed squadrons to achieve specific tasks.

In terms of Tech Level, Armour, Thrust, software and skill levels, the squadron operates at the level of the worst performing fighter within it. So, for example, if you have a squadron of high-performance Thrust 9 space superiority fighters that are joined by a Thrust 6 missile fighter, the whole squadron is limited to Thrust 6. However, in terms of sensors, always use the highest quality (taking into account both actual sensors and the skill of the operator) within the squadron.

COMBAT

Every fighter in the squadron must perform the same pilot action every round. However, if the fighters have additional crew members, they *can* use separate actions, in the same way as crew on board a ship can.

All weapons of the same type within a squadron make a single attack roll, gaining DM+1 to the attack roll for every fighter after the first in the squadron. Resolve



damage as you would for a missile salvo, rolling once for damage, applying any armour and screens, and then multiplying by the effect.

Note: The Referee can allow squadrons to split their attacks between different targets within range, reducing the bonuses accordingly for each attack. However, be aware that this greatly increases the workload and is not recommended for anything other than special circumstances.

DOGFIGHTING

When two or more squadrons meet in space, battle can quickly devolve into a swirling swarm of hornets that relies on equal parts technology, reactions, situational awareness and luck.

Squadrons use the dogfighting rules detailed on page 173 of the *Traveller Core Rulebook* as normal, treating the entire squadron as a single ship. However, do not total the tonnage of the fighters within the squadron when applying modifiers to the dogfighting roll. Instead, use the average tonnage of the fighters within the squadron (this does not apply unless the Referee allows the use of fighters that are 50 tons and above).

Squadrons can engage in dogfights with much larger ships as normal, using their small size and large numbers to evade attacks and deliver devastating strikes against their lumbering enemy.

A dogfight starts as soon as a craft ends its manoeuvre step within Close or Adjacent range of an enemy and ends when a craft moves beyond close range.

FIRING INTO DOGFIGHTS

Dogfights can rapidly devolve into massive furballs compacted into tiny areas of space, a nightmare for the pilots involved and a tense situation for craft further away who are attempting to attack targets within. Picking out individual targets without accidentally hitting a fast-moving friendly craft can be extremely difficult.

Ships not involved in a dogfight can attempt to attack targets that are engaged within it but do so with DM-4 to their attack rolls.

If the Referee permits it, such attacks can be attempted without this penalty but before the attack roll is made, roll 1D. If the result is even, the attacker selects the target as normal. If the result is odd, then the defender can select any craft involved in the dogfight to be the target, even if it is friendly to the attacker!

Needless to say, employing this kind of free-fire tactic is not standard Imperial Navy policy.

POINT DEFENCE

While the common perception of a fighter is as an attack platform or a ‘barrier’ to incoming enemies, they are often employed in a defensive role when missiles are flying through space, providing another layer of point defence for a fleet.

Any fighter or squadron equipped with pulse or beam lasers may use the point defence action (see page 171 of the *Traveller Core Rulebook*) to defend either themselves or any ship being attacked by missiles that is within Adjacent or Close range.

If the Referee deems a fighter or squadron to be suitably placed and they have a Thrust score higher than that of the missile salvo, fighters may perform the point defence action against any missile salvo while it is travelling to the target – this can be many thousands of kilometres away from the salvo’s target.

Because space is very large, the chances of a fighter being in the right place to intercept fast-moving missiles is slim unless the salvo was expected before it was launched. The Referee may insist on Travellers announcing that they are ordering their fighters to position themselves between fighting ships specifically to intercept missiles or they may be allowed to break off an attack on an enemy ship to intercept missiles it has just launched.

RECOVERY

Fighter pilots tend to be well-trained in the recovery of their craft on board a mother ship under simulated combat conditions. Merely docking with the vessel is a simple enough task for a skilled pilot but wing commanders often insist the pilot docks at high velocity, as may be required when the carrier needs to depart a combat zone quickly.

On carriers equipped with a recovery deck, a fighter may safely dock with a Routine (6+) Pilot check (1D minutes, DEX), provided that they are within Short range of the carrier at the beginning of the attempt.

DM-1 is applied to this check for every point of Thrust expended by the fighter or the carrier in the round in which it is recovered. This is commonly done when the fighters come in ‘hot’ from combat and need to be recovered quickly or when the carrier itself is forced to take evasive manoeuvres.

In addition, a further DM-1 is applied to the check for every additional fighter that attempts to land in the same round, unless they are all part of the same squadron.

Failure results in 1D damage to both fighter and carrier, multiplied by the sum of the Thrust expended by the fighter and carrier; any armour possessed by either does not reduce this damage. Recovery decks are internal to ships and so are not properly armoured and the armour mounted on fighters is designed to protect it from incoming fire, not clumsy flying.

FLEET BATTLES

Most space combat encounters involve just a handful of ships. For small battles like these, the space combat rules presented in the *Traveller Core Rulebook* will suffice, no matter the tonnage of the ships involved, whether they be a group of adventure-class ships (2,400 tons or less for each ship) or capital ships in the multi-100,000-ton range. However, actions featuring a dozen or more ships can be cumbersome to resolve. The rules presented here provide an alternative method to determine the outcome of such battles.

Starship fleet battles are a mainstay of military science fiction and there are multiple ways for a Referee to resolve them. Even with the reduced complexity of the fleet combat system presented here, going through the steps of a battle takes time, so the Referee should consider how to run it before a game session begins. If the Travellers want to take part, fleet combat can be performed during game time with the actions of the ships involved determined by the Referee and Travellers. However, if the Travellers have less interest in going through fleet combat step-by-step, the Referee can run the battle ahead of time, recording the events of each round so they can be conveyed to the Travellers as events transpire. Should the Travellers' actions alter the course of events, simply adjust the results; a pre-set fleet combat game need not be a railroad that the Travellers are forced to ride. Use the generated events as a guide, altering them as necessary.

Alternatively, the final outcome of a fleet battle may be determined by the Referee ahead of time and the Travellers simply play their part. If this is the desired approach, the standard space combat rules may be used for the Travellers, focusing only on their ship and those closely associated with it, including whichever enemy vessels are to take part in the more limited encounter. The outcome of the larger fleet battle happening around them may simply be predetermined by the Referee or resolved using the rules in this chapter.

FLEET CREWS

Fleet combat is quite different to space combat in that it deals with potentially dozens of ships instead of just a few. In space combat, the heroic actions of a single starship crew can be divided by role but fleet combat, by definition, covers the actions of a score or more ships crewed by hundreds or thousands of individuals. If the Travellers are the crew of a capital ship in a naval campaign, they may be in command of the fleet, squadron or task force featured in the scenario. In a naval campaign, the Travellers are usually the commanding officers of a capital ship: the captain, executive officer, chief pilot, chief engineering officer, gunnery officer and so on.

To command a fleet, a capital ship must have a command bridge, As described under Install Bridge, on page 19. If the Travellers are the officers of the fleet's flagship, then making a fleet combat session engaging might be as simple as allowing them to devise a strategy and execute the plan as a group, deferring to their captain for the final word. Alternatively, they may divide the fleet into squadrons or individual ships and conduct the actions of their respective portions of the fleet. Even if the Travellers are not in command, allowing them to execute the actions of the ships should provide the desired entertainment.

FLEET SHEET AND FLEET SHIP SHEET

Before conducting a fleet battle, the Referee and Travellers must prepare a Fleet Sheet for each side of the battle and Fleet Ship Sheets for every ship involved. This should only take a few minutes per ship, as described in Fleet Evaluation on page 110.

For convenience, a Fleet Sheet and two Fleet Ship Sheets are provided. For the Fleet Ship Sheets, the first is a sample, filled out in preparation for a fleet combat session and the second is a blank sheet that may be reproduced. In addition, a blank Squadron Sheet is provided to record fighters allocated to battle squadrons during a fleet combat engagement.

FLEET SHEET

Enter the fleet name and select a flagship. Enter a squadron name for each squadron and then list its front-line fighting ships below. The reserve section is for ships not intended to serve in the plane of battle (e.g., tankers, transports, auxiliaries and so forth).

FLEET NAME: **FLEET FLAGSHIP:**

Squadron Name:		Squadron Name:		Squadron Name:	

Reserve		Reserve		Reserve	

FLEET NAME: **FLEET FLAGSHIP:**

Squadron Name:		Squadron Name:		Squadron Name:	

Reserve		Reserve		Reserve	

FLEET SHIP SHEET – PANTHERESS – TIGRESS-CLASS DREADNOUGHT

Ship Name: *Pantheress*		**Thrust:** *6*		**Auto-Repair:** 2	**Adj. Hull Points**	*104762*
Class: *Tigress-Class Dreadnought*		**Jump:** *4*			**Critical HIt Thresholds**	
Crew Skill: *1*		**Armour:** *5*			**10%**	*10,477*
Offensive DM: *6/5*		**Defensive DM:** *6*			**20%**	*20,953*
					30%	*31,429*
Traits	*Antirad, Fleet Defence*				**40%**	*41,905*
					50%	*52,381*
Squadrons	**Number**	**Weapons**	**Damage**	**Deployment**	**60%**	*62,858*
Heavy Fighters	*300*	*Pulse Laser, Missile Rack*	*3, 4*	*30*	**70%**	*73,334*
					80%	*83,810*
					90%	*94,286*
WEAPONS	**Damage/Multiple**	**Traits**	**Short**	**Medium**	**Long**	**Very Long**
Meson Spinal Mount (TL15) – 11x	*6/11,000*	*AP ∞, Radiation*				
Triple Turrets (beam lasers) x 100	*1/1*	–				
Double Turrets (fusion guns) x 100	*4/1*	*Radiation*	–	–	X	–
Single Turrets (particle beam) x 100	*4/1*	*Radiation*	–	–	X	–
			–	X	–	–
			–	–	–	X
Missile & Torpedo Salvoes	**Number**	**Type**	**Damage**			
Missiles	*4,800*	*Standard*	*4*			
Missiles	*360*	*Nuclear*	*10*			
DEFENCES						
Salvo Defence	**Point Defence**	**Lasers**	**Repulsors**	**EW**	**TOTAL**	
	600	*300*	*220*	*115*	*1,235*	
Screens			**Sandcasters**		**Rating**	
Meson Screens	*315*		*Triple Turrets (sandcasters) x 100*		*300*	
Nuclear Dampers	*405*					

FLEET SHIP SHEET

Ship Name:		**Thrust:**		**Auto-Repair:**	**Adj. Hull Points**	
Class:		**Jump:**			**Critical HIt Thresholds**	
Crew Skill:		**Armour:**			**10%**	
Offensive DM:		**Defensive DM:**			**20%**	
					30%	
Traits					**40%**	
					50%	
Squadrons	**Number**	**Weapons**	**Damage**	**Deployment**	**60%**	
					70%	
					80%	
					90%	
WEAPONS	**Damage/Multiple**	**Traits**	**Short**	**Medium**	**Long**	**Very Long**
Missile & Torpedo Salvoes	**Number**	**Type**	**Damage**			
DEFENCES						
Salvo Defence	**Point Defence**	**Lasers**	**Repulsors**	**EW**	**TOTAL**	
Screens			**Sandcasters**		**Rating**	

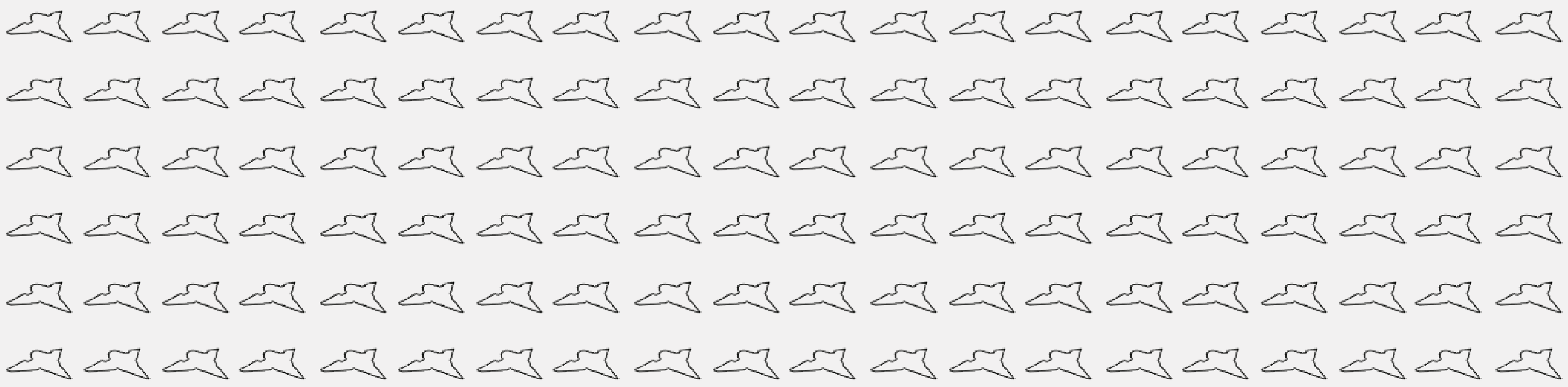
FIGHTER SQUADRON SHEET (BLANK)

Evaluate squadrons as described in Fighter Squadrons on page 114. Draw lines around the fighter check boxes to establish squadron groups of variable size. Use the individual fighter check boxes to record weapons usage and casualties during fleet combat.

Fighter Class:
Weapons:
Defensive DM:
Hull Points:

Squadron Name:
Crew Skill:
Offensive DM:
Armour:

Fighter Class:
Weapons:
Defensive DM:
Hull Points:

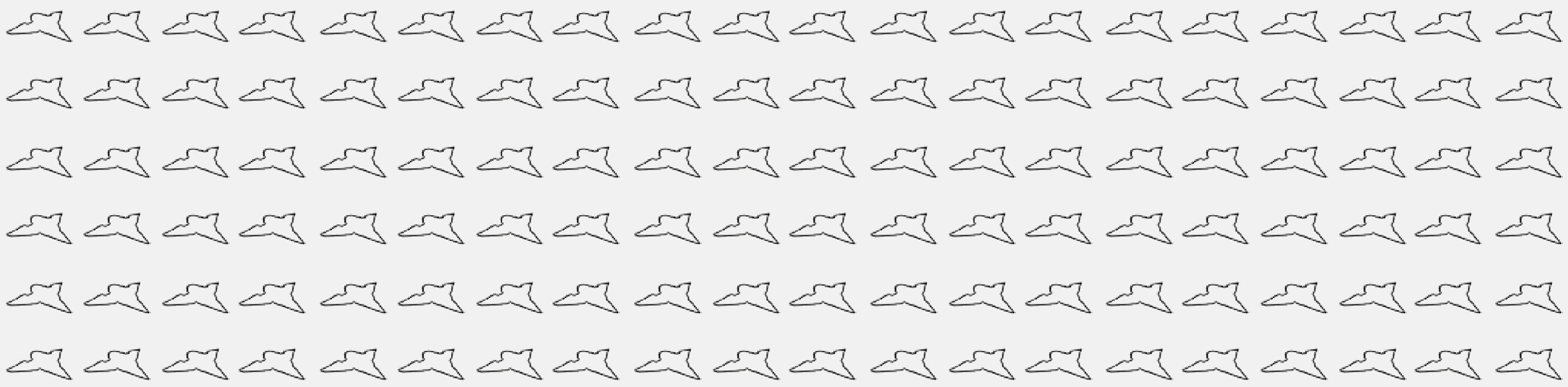


Squadron Name:
Crew Skill:
Offensive DM:
Armour:

Fighter Class:
Weapons:
Defensive DM:
Hull Points:

Squadron Name:
Crew Skill:
Offensive DM:
Armour:

Fighter Class:
Weapons:
Defensive DM:
Hull Points:



FLEET EVALUATION

To determine the outcome of a fleet battle, there must be an evaluation of the forces involved. This includes a description of each fleet and a summary of each ship's key offensive and defensive capabilities. Use a Fleet Sheet to list all the ships of both fleets, and a Fleet Ship Sheet to record information for each ship involved in the battle. Note that fighter squadrons are recorded on a separate Fighter Squadron Sheet, which is also provided. Copies of the Fleet Sheet, Fleet Ship Sheet and Fighter Squadron Sheet can all be downloaded from the Mongoose Publishing website.

To help illustrate how to use the Fleet Ship Sheet, the *Pantheress*, a *Tigress*-class dreadnought, has been used as an example.

Ship Name and Class

This is the name and type of ship. The ship in the example is named the *Pantheress* and its class is *Tigress*-class Dreadnought.

Crew Skill

The average skill level of the crew across all duties and positions. For the sake of simplicity, Referees can assume a skill level of 0 or 1 represents a green or inexperienced crew, skill level 2 represents trained or experienced crew, while skill level 3 is suitable for veterans. Skill levels of 4 or higher should be extremely rare – while it is certainly possible for individuals to be this highly skilled, finding enough exceptional people to crew a ship is extremely difficult.

Offensive DM

This score represents the overall offensive capabilities of the ship. Separate DMs are recorded for standard and missile weapons.

Standard weapons include all turrets, barbettes, bays and spinal mounts. The standard Offensive DM is calculated as follows:

- Start with half the Crew Skill score of the ship rounded up.
- Add the rating of any Fire Control or Advanced Fire
- Control software.
- Add +1 if the ship is TL12–14, and +2 if it is TL15.

Missiles weapons include both missiles and torpedoes. The missile Offensive DM is recorded as follows:

- Add the rating of any Launch Solution software.
- Add +1 if the ship is TL12–14, and +2 if it is TL15.

INCORPORATING THE NAVAL CAMPAIGN SOURCEBOOK

For a more advanced approach to the Crew Skill level, refer to the *Naval Campaign Sourcebook* from the *Element Class Cruisers* boxed set. Naval campaigns use the Crew Effectiveness Index (CEI) to determine the abilities and effectiveness of a ship crew. The index takes into account a more complex evaluation of the crew's skill levels and provides a Task DM for various CEI levels. Also taken into consideration is the ship's recent performance and readiness.

The CEI is used to calculate the Effective CEI (ECEI), a measure of the ship's current readiness and experience. A ship that is fresh from the fight and victorious in recent battles will have a higher rating, which enhances its Task DM. Likewise, a ship that has not been put to the test recently, perhaps due to a green crew or one that has recently encountered setbacks or losses in battle, will have a lower ECEI and therefore a lower DM. The naval campaign rules may also be used to determine Morale, which plays a significant factor in fleet combat. See the section on Morale on page 122.

List the two Offensive DMs, separated by a slash. For example, the *Pantheress* has a Crew Skill score of 1, Advanced Fire Control/3 software and the ship is TL15 for a total standard Offensive DM of 6. For the missile Offensive DM, the *Pantheress* has Launch Solution/3 software and once again applies a +2 for being TL15, which adds up to a total missile DM of 5. Therefore, the Offensive DM for the Pantheress is recorded as 6/5.

Traits

See the table next page for the various Traits that a ship might have.

Squadrons

List fighter squadrons, if available. Specify the number of fighters, their weapons, damage value for each weapon type and the deployment rate. The deployment rate is the number of launch tubes x 10.

Trait	Requirement	Effect
Antirad	Radiation Shielding	The ship ignores all Radiation damage except from meson weapons.
Black Globe	Black Globe Generator	The ship can reduce 20–80% of all incoming damage every round, at a proportional cost of DM-1 to -4 to its own attack rolls and Thrust. If the amount of damage reduced in a single round is greater than its maximum capacitor value divided by 100, the ship is immediately destroyed.
Fleet Defence	Point Defence software	The ship may share its Salvo Defence score with one other ship within Close range.
Hardened	At least 75% of systems that use Power are Hardened	The ship ignores all damage from ion weapons.
Reflec	Reflec Armour	Increase Armour against turret weapons by +10%, rounding up.

Thrust and Jump

These are the available Thrust and maximum jump scores.

Armour

Divide the ship's Armour by 3.5, rounding up. For example, the Tigress-class dreadnought has Armour 17. Divide that value by 3.5 and round up for a fleet combat Armour 5.

Defensive DM

This is an overall score that represents several different factors involved in the defensive capabilities of the ship. It is calculated as follows:

- Start with half the Crew Skill score of the ship rounded up.
- Add the rating of any Evade software.
- Add +1 if the ship is TL12–14, and +2 if it is TL15.

For example, the Pantheress *has a Crew Skill score of 1. Half of that score rounded up is 1. The ship has Evade/3 software, adding 3 to the score, and it is TL15, adding an additional 2. Adding these values together, we have a total Defensive DM of 6.*

Auto-Repair

The rating of the ship's Auto-Repair software, if any.

Adjusted Hull Points

As with the normal space combat rules, the fleet combat system uses Hull points to track the damage sustained by vessels and when these are reduced to zero, the ship is wrecked, becomes totally inoperable and it cannot be repaired in the field. The ship may be recovered and towed to a shipyard for extensive repairs but for the purposes of fleet combat, it is no longer functional.

Hull points can be found on each ship's stat sheet. For example, the *Tigress*-class dreadnought has Hull 366,666. "Divide the Hull Points by 3.5, rounding up. Therefore, the Tigress fleet combat hull points would be 104,762

Critical Hit Thresholds

Ships incur a critical hit after each 10% of their Hull points are eliminated. Calculate each 10% increment and list them in this column. Having these figures ready makes it easier to determine when critical hits have occurred as a ship incurs battle damage.

Weapons

There are three fields for weapons: the weapon listing itself, range and damage. List the weapon type and the number of them installed on the ship. Range is the maximum range of the weapon. Damage and Damage Multiples are obtained from the table on page 112.

For turrets, count each weapon. So, 100 triple beam laser turrets is counted as 300 beam lasers. Missile and torpedo weapons are covered on page 36.

ORTILLERY AND ION

Ortillery and ion weapons are not listed in the Fleet Combat Weapons table. Weapons with the Orbital Strike and Orbital Bombardment traits are expected to be used specifically as ortillery and not typically employed during fleet combat against other ships. Ion weapons do not inflict damage but affect the performance of opposing ships as described in the separate Ion Weapons table.

Fleet Combat Weapons

Weapon System	Weapon	Damage/Multiple	Weapon System	Weapon	Damage/ Multiple
Turrets	Beam Laser	1/1	Small Bays	Meson Gun	5/10
	Pulse Laser	2/1		Fusion Gun	6/10
	Fusion Gun	4/1		Particle Beam	6/10
	Plasma Gun	3/1		Railgun	3/10
	Particle Beam	4/1	Medium Bays	Meson Gun	6/20
	Railgun	2/1		Fusion Gun	7/20
Barbettes	Beam Laser	2/3		Particle Beam	8/20
	Pulse Laser	3/3		Railgun	5/20
	Fusion Gun	5/3	Large Bays	Meson Gun	6/100
	Plasma Gun	4/3		Fusion Gun	10/100
	Particle Beam	4/3		Particle Beam	10/100
	Railgun	3/3		Railgun	6/100
Spinal Mounts	Meson	6/1000 per factor			
	Particle	8/1000 per factor			
	Railgun	4/1000 per factor			

Ion Weapons

Weapon	Effect per Weapon
Ion Barbette	75
Small Ion Bay	200
Medium Ion Bay	500
Large Ion Bay	3,500

For Ion weapons, multiply the Effect per Weapon figure by the number of like weapons used to obtain the total ion weapon effect. This number is inflicted upon the power system of the target ship, which must then make power-budget decisions that last one or more rounds. In fleet combat, this is simplified. Divide the total ion weapon damage by the ship's Hull points, rounding down, and check the Ion Damage table for the results.

For example, if an Ion weapon system inflicts 30,000 damage on a ship with 15,000 Hull Points, the result is 2. The targeted ship must reduce Thrust by 2 or eliminate 2 weapon systems. The targeted ship may select a combination of the effects. For example, a result of 2 may alternatively result in the temporary loss of 1 Thrust and 1 weapon system for the round.

The effect lasts for one round unless the attacking ship's Offensive DM is twice the Defensive DM of the target ship, in which case it lasts for two rounds. Note that hardened systems are immune to ion weapons.

Ion Damage

Ion Damage/ Adjusted Hull Points	Effect
1	Reduce Thrust by 1 or eliminate 1 weapon system
2	Reduce Thrust by 2 or eliminate 2 weapon systems
3	Reduce Thrust by 3 or eliminate 3 weapon systems
4	Reduce Thrust by 4 or eliminate 4 weapon systems
5	Reduce Thrust by 5 or eliminate 5 weapon systems
6	Reduce Thrust by 6 or eliminate 6 weapon systems

MISSILE AND TORPEDO SALVOES

Missiles and torpedoes attack in salvoes, much as they do in space combat. Missiles and torpedoes have a Damage value just like other weapon systems. However, they do not have Damage Multiples. Instead, the number of missiles or torpedoes that make it through a ship's defences becomes the multiple.

Fleet Missile/Torpedo Damage

Missile	Damage
Advanced	5
Anti-matter	20
Fragmentation	3
Long Range	3
Multi-warhead	3
Nuclear	10
Standard	4

Torpedo	Damage
Advanced	7
Anti-matter	30
Anti-matter Bomb-pumped	8
Antiradiation	6
Bomb-pumped	4
Multi-warhead Antimatter	10
Multi-warhead Standard	4
Multi-warhead Nuclear	6
Nuclear	20
Plasma	10
Standard	6

Salvo Defence: This score is applied against salvoes of missiles and torpedoes. Salvo defence is recorded for four separate categories: point defence weapons, laser turrets, repulsors and electronic warfare. Add the results of all four categories to obtain the ship's salvo defence pool. This pool is used for missile and torpedo defence over the course of a round and is restored to maximum in the following round provided that the systems used for point defence have not been damaged or destroyed in combat.

Calculate each category of the salvo defence pool as follows:

For point defence weaponry:
- Add +4 for every Type I Point Defence Battery.
- Add +8 for every Type II Point Defence Battery.
- Add +12 for every Type III Point Defence Battery.

For laser turrets (if used for salvo defence):
- Add the Crew Skill score of the ship for every beam or pulse laser turret.
- Add an additional +1 for each double turret and +2 for each triple turret.

For repulsors:
- Add five for every small repulsor bay.
- Add 10 for every medium repulsor bay.
- Add 50 for every large repulsor bay.

For electronic warfare:
- Divide the number of sensor operators by three, rounding up, to determine the base number of missiles eliminated. For example, if a ship has 67 sensor operators, the base number is 23.
- Add the Crew Skill score to the Electronic Warfare software number and multiply that by the base number, obtained above to obtain the electronic warfare pool number.

Add all of the above together to obtain the point defence pool for the current round. Each point removes one missile from incoming salvoes.

Against torpedoes, double the amount taken from the pool. For example, 100 taken from the pool only eliminates 50 torpedoes.

Note that laser turrets and repulsors can also be used offensively. Only apply laser turret and repulsor scores to the pool if these weapons are being used for salvo defence.

Screens: Separate scores are recorded for meson screens and nuclear dampers. For each, add Crew Skill score to 3.5, multiply that by 10 and then multiply the resulting figure by the number of screens.

Sandcasters: Total all sandcasters installed in turrets on the ship. For example, the *Pantheress* has 100 triple sandcaster turrets, so this value is 300.

Fleet combat is similar to space combat, including the use of six-minute combat rounds. During each round, the Travellers should work together to determine how to use their resources. To keep things moving, the Referee might want to impose a time limit on deliberations, perhaps 5–10 minutes per turn. This adds to the tension and excitement of the action and ensures fast and efficient resolution of the battle.

FIGHTER SQUADRONS

Fighters may be assembled into squadrons of any size. In battle, each squadron is treated much like an individual ship with certain exceptions. To evaluate the abilities of a fighter squadron, determine the following and record the information on a Fighter Squadron Sheet (blank sheet provided in this chapter for reproduction purposes):

Fighter Squadron Name and Class: The name of the squadron, for example Blue Squadron or 3rd Squadron. Keep in mind that if squadrons are being launched from multiple ships, the identifiers can become more complicated due to the need for more clarity during communications. For example, *Pantheress 12* for the 12th squadron launched by the *Pantheress*. The class is the fighter class. For example, Heavy Fighter.

Crew Skill: The Crew Skill is usually the same as the squadron's mothership but may be different under various circumstances. For example, it could be one level lower if it is a new and very green squadron, or it might be a level or two higher if a crack squadron of fighter pilots has been assigned to the ship.

Weapons: List each weapon, its range and damage value, obtained from the Fleet Combat Weapons or Missile and Torpedo Weapons table. When evaluating the range of fighter weapons, be sure to consider the range limitations of single Firmpoint-mounted weaponry if the fighters in the squadron are equipped with them. See Chapter 2: Weapons and Screens for more information.

Offensive DM: Similar to assigning an Offensive DM with the following differences:
- The Crew Skill score of the squadron.
- Add the rating of any Fire Control software.
- Add +1 if the fighters in the squadron are TL12–14, and +2 if they are TL15.

Defensive DM: Calculated as follows.
- The Crew Skill score of the squadron.
- Add the rating of any Evade software.
- Add +1 if the ship is TL12–14 and +2 if it is TL15.
- Add DM+1 against opposing ships at Close or Adjacent Range.

Thrust: The maximum Thrust rating of the fighters in the squadron.

Armour: Divide the ship's Armour by 3.5, rounding up. For example, the light fighter has Armour 2. Divide that value by 3.5 and round up for squadron Armour 1.

Hull Points: Obtain the Hull points from the fighter's description and multiply it by the number of fighters in the squadron. Every time a number of Hull points equal to an individual fighter's Hull points is eliminated during combat, one fighter is lost from the squadron.

FLEET COMBAT ROUNDS

STARTING A BATTLE

When ships fight using the fleet combat system, they follow a similar procedure to the normal rules for space combat but events are streamlined. There is no detailed combat manoeuvring and the crew take few specific actions.

Before a battle begins, it is important to note where fleets are relative to one another. In many scenarios, all that must be known is how far away each fleet is from its opponents. This is determined by using Range Bands.

Range Bands

Range Band	Distance
Adjacent	1km or less
Close	1–10km
Short	11–1,250km
Medium	1,251–10,000km
Long	10,001–25,000km
Very Long	25,001–50,000km
Distant	More than 50,000km

Most encounters start at Very Long or Distant ranges, when the combatants first detect one another. However, actual combat starts when one of the fleets moves into range of their opponents' weapons, typically Long range. For a more detailed approach, see Fleet Manoeuvres on page 122, which uses a Fleet Manoeuvre Chart to more closely monitor movement and range.

SELECT A FLAG SHIP

Before the battle, each side must select its flag ship. A flag ship must be equipped with a command bridge and contains a fleet's commanding officer and staff. As long as the flag ship remains in the battle, its fleet receives DM+1 during the Morale check that is made each round. Keep in mind that neither side in a fleet battle necessarily knows which ship is the flag ship but it is usually the largest, most fearsome ship in the fleet.

INITIATIVE

Initiative is rolled for each ship in the battle, as follows: 2D + the ship's Crew Skill + the fleet's Thrust score + Offensive DM.

For a more streamlined approach, simply roll Initiative once for each fleet, using an average or approximation of the ships' Crew Skill scores.

TACTICS (NAVAL) SKILL

In addition, the commander of each fleet may make a Tactics (naval) check at the start of a battle. The Effect of this check is added to the Initiative of the fleet.

FLEET COMBAT STEPS

Much like in space combat, fleet combat is conducted in steps:

1. **Manoeuvre Step:** In order of Initiative, each fleet manoeuvres based on its Thrust. The ships of a fleet must move as a unit, staying within Short range of each other, otherwise they disperse into multiple fleets or squadrons. Fighter squadrons and battle riders are the exception and may be launched at different Thrust levels and extend their reach beyond Short range in order to engage with the enemy.
2. **Attack Step:** In order of Initiative, each ship can attack, using weapons grouped in batteries of the same type. These are referred to as weapon systems.
3. **Actions Step:** In order of Initiative, ships can perform other actions, such as dispersing into squadrons, recovering fighters, checking morale, and jumping out of the system.

Once the Actions Step is complete, a fleet combat round ends and, as long as there are still ships fighting, a new round begins with the Manoeuvre Step.

MANOEUVRE STEP

In order of Initiative, each fleet may allocate Thrust to movement (closing or increasing the range between it and another fleet). Optionally use the Fleet Manoeuvre Chart to track fleet movements. Using the map is helpful if the fleet battle occurs at a static location, such as a planet or gas giant, or when squadrons break off from the fleet, forming separate combatants.

For most fleet combat encounters, calculating the relative positions of two opposing fleets is all that is needed. However, for more complex encounters, vector-based movement rules may be included, as described on page 116.

Ship Movement

Range Band	Distance	Thrust Required	Example
Adjacent	Less than 1km	1	Docked or in tight formation
Close	1–10km	1	Nearby or dogfighting vessels
Short	11–1,250km	2	Ships in same orbital path
Medium	1,251–10,000km	5	Surface to orbit
Long	10,001–25,000km	10	Near a planet
Very Long	25,001–50,000km	25	Within jump limit
Distant	More than 50,000km	50	Distant ships

MOVEMENT

The amount of Thrust required to increase or decrease the Range Band between fleets by one category, up or down, is shown on the Fleet Movement table – the Thrust listed is the amount required to move from that Range Band to either the next closest or next farthest. A fleet can spend Thrust over multiple rounds to close or open a category.

If two fleets are travelling towards one another, then the proportion of their Thrusts devoted to movement are added together for the purposes of Range Band changes. If one fleet is trying to escape another, then subtract the lower Thrust from the higher to work out the Range Band change – the faster fleet gains on or pulls away from the slower.

It takes a lot of Thrust to move between Range Bands once a fleet gets to Long range or further. Space is vast and even the most powerful fleets take a long time to cross any significant distance. At these ranges, fleets rarely expend vital energy trying to change range unless they are looking to board their targets or escape the battle.

VECTOR

A fleet's vector – its direction and accumulated velocity – are only important if two fleets engage each other in a limited battlespace. The reasons this might occur are many. If one fleet is defending a world, moon, orbital starport, planetoid or other large celestial object, then the battle might well occur in a limited sphere. A fleet might be jockeying for access to a gas giant or other fuel source, positioned in high guard over squadrons that are wilderness refuelling or simply 'bugging out' towards jump point with great haste.

Whatever the reason, there are times when fleet combat occurs in a limited space. Under these circumstances, it is important to keep track of direction and how many successive rounds are spent accelerating in one direction. For example, a fleet or squadron that applies 6 Thrust in one direction for two rounds moves at twice the speed had it only applied 6 Thrust for one turn. Supposing that 6 is the maximum Thrust of the fleet, two rounds are required to slow back down to zero if desired. If a fleet continues to accelerate, it becomes exceedingly more time-consuming for it to slow down since every member of the fleet must turn around and reduce speed by applying the desired amount of Thrust.

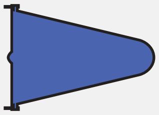
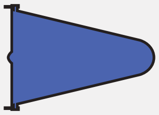
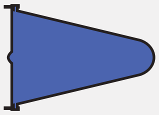
If two fleets are not engaged in battle within a limited sphere, then there is no need to record the vector. Simply keep track of the relative differences in speed between the two opposing fleets as described in Movement.

RANGE

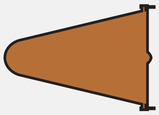
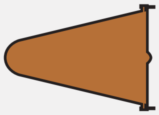
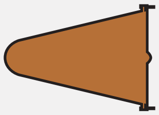
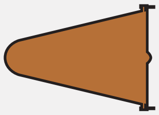
The range between the ships of a fleet is important. In typical deployments, a fleet can cover a large area, anywhere from close orbit of a single world, stretching out to the 100-diameter limit of that world, or even multiple worlds in a single star system. In the Third Imperium universe, a numbered fleet of the Imperial Navy is divided into squadrons that patrol an entire subsector.

For the purposes of fleet combat, combatants are assembled in close formation, creating a 'plane of battle' against an opposing fleet. The term hails back to the age of sail, in which oceangoing naval ships would form a 'line of battle', which was intended to prevent friendly fire. In three-dimensional space combat, the notion of a plane represents the ships of a fleet occupying positions in space roughly equidistant from an opposing mass of ships. In truth, the planar metaphor quickly breaks down once a battle begins and things become more chaotic. Distances vary as the ships of each fleet perform evasive manoeuvres and turn to point all of their firing arcs at the enemy. While

Cumulative Thrust

Turn 1	Turn 2	Turn 3
Thrust 6	Thrust 6	Thrust 6
		
Movement 6	Movement 12	Movement 18

Cumulative Reverse Thrust (Slowdown)

Turn 1	Turn 2	Turn 3	Turn 4
Thrust 6	Thrust 6	Thrust 6	Thrust 6
			
Movement 18	Movement 12	Movement 6	Movement 0

the notion of a plane of battle is convenient, in practice, distances and formations fluctuate. Generally speaking, the ships of a fleet attempt to stay within Medium range of each other while maintaining a plane of battle that faces the enemy.

The ships of a fleet often have several ships in reserve. The reserve includes tankers, transports, auxiliaries and other non-combatant vessels. Ships in the reserve usually stay at Very Long or Distant range from enemy ships, limiting their exposure to attacks.

There are three operational ranges for fleets, each of which grants certain advantages and disadvantages:

Adjacent and Close: Fleet elements within these ranges can use Point Defence software to defend one another and transfer personnel between ships within a single combat turn. The ships of a fleet that maintain adjacent to close range gain +1 to their Defensive DM.

Short: This is the maximum distance that ships in the plane of battle operate from one another.

Medium: Ships at Medium range from one another form separate fleets or squadrons. Ships that stray to Medium range can maintain their position in the fleet provided they return to Short range in the following turn. Ships in the reserve are the exception and are considered part of the fleet in spite of their distance.

LAUNCH FIGHTERS

Fighters may be launched during the manoeuvre step. For capital ships, this almost invariably means firing them from launch tubes. Fleets often deploy some or all of their fighters before approaching an enemy fleet. However, this makes the fighters vulnerable to attack as soon as the fleets come within firing range of each other, so some fleet commanders choose to wait until the battle has begun. Fighters may attack in the same turn that they are launched.

ATTACK STEP

Once all fleets have worked out their movement, they can launch attacks. This is done in Initiative order.

SELECT TARGETS AND ASSIGN WEAPONS

At the beginning of a turn, all ships and squadrons of the attacking fleet must declare targets before firing. A ship may divide its weapon systems to attack multiple targets or apply them all to the same target. Likewise, weapons of each system may be divided into batteries to attack multiple targets. Therefore, a ship with 20 particle beam barbettes may use all of them against a single target or divide them into smaller batteries to attack more than one target.

There are two weapon systems that may be used for offensive or defensive purposes: laser turrets and repulsors. These weapons may be divided into multiple batteries, some for point defence and some for attacks, during the target selection phase. If a battery is used for offensive purposes, the weapons in that battery are not available for point defence during the current round but may be reassigned in the following round.

As described in Fighter Squadrons, the fighters in a squadron are considered to be a single ship for purposes of attacks.

FIRING WEAPONS

There are three types of weapons: standard (all turrets, barbettes and bays), spinal mount and missile (which includes both missiles and torpedoes). In the desired order, make attacks with each weapon system of a single ship before proceeding to the next ship in the fleet. Note that only spinal mount weapons require a roll to hit. All other attacks are assumed to hit with varying degrees of success.

DETERMINING DAMAGE FOR TURRETS, BARBETTES AND BAY WEAPONS

To calculate the damage inflicted by turrets, barbettes and bay weapons, go through the following:

- Obtain the base Damage value of the weapon, listed in the Fleet Combat Weapons table on page 112.
- For all weapons except meson guns (which ignore armour), subtract the target ship's Armour from the adjusted Damage value.
- Fusion gun and railgun bays add DM+1 when attacking armoured ships.
- Add DM+1 if the weapon has the High Yield or Intense Focus customisation. Note that this is not cumulative for weapons that have both features.
- Multiply the adjusted damage by the Damage Multiplier.
- Multiply the adjusted damage by the number of like weapons used.

For example, a cruiser fires a battery of 50 particle beam bays at a fleet carrier. The base Damage value for the weapon is 6. Subtract the fleet carrier's fleet combat Armour value of 3. The adjusted Damage value is 3 (6-3). Multiply the adjusted damage by the weapon's Damage Multiple, which is 10 for small bays, for a result of 30 and then multiply that number by the total number of small bays used, which is 50 for a damage subtotal of 1,500.

Finally, consult the Attack Effectiveness table to determine the final Damage value.

ATTACK EFFECTIVENESS

Calculate the attack effectiveness by adding up the following factors and then consult the Attack Effectiveness table for the final Damage Multiple:

- Subtract the target ship's Defensive DM from the Offensive DM of the attacking ship for the base Attack Factor.
- Add +1 if attacking a target at Short range.
- Subtract -2 if attacking a target at Long range or subtract -4 if the target is at Very Long range.
- Subtract -2 if attacking a target (or squadron of targets) who are each less than 100 tons in size with any weapon other than turrets or barbettes.

The result is then compared to the Attack Effectiveness table and the weapon system's Damage is modified as shown.

Note that all weapon systems cannot attack a target beyond their maximum range.

Attack Effectiveness

Attack Factor Total	Damage Multiple
-6 or less	0
-5 to -4	0.25
-3 to -2	0.5
-1 to 0	0.75
1–2	1
3–4	1.25
5+	1.5

Multiply the damage subtotal by the Damage Multiple for the final damage of the attack.

SPINAL MOUNT WEAPONS

Spinal mounts are the only weapons that must roll to hit. The standard space combat rules apply, using the Crew Skill score for the Gunner skill. Be sure to

ARMOUR

Armour reduces damage for all types of weapons except meson guns and ion weapons, which ignore all armour. The higher the armour value, the greater the reduction in damage. In fact, as armour values increase, some weapons become exceedingly ineffective.

Well-armoured ships are impervious to attacks from weapons that do not inflict enough damage to penetrate their armoured outer shells. If a weapon's Damage value is less than half of a ship's Armour, it does no damage. As described in Fleet Evaluation, Armour is determined by dividing its original Armour value by 3.5 and rounding up for the purposes of fleet combat. For example, a ship with Armour 25 has a fleet combat Armour 8 (25/3.5, rounded up). Weapons whose Damage rating is 4 or less do no damage to this ship.

apply all range, target size and fire control software DMs. If a hit is scored, reduce the Damage score by Armour (if applicable), multiply this by the spinal mount damage multiple (1,000 per factor) and apply the damage to the target ship.

MISSILE WEAPONS

Unlike lasers, particle beam and other energy and projectile weapon systems, missile weapons have a flight time. Refer to the Missile Flight table for guidance.

Missile Flight

Range	Rounds-to-Impact
Medium and below	Immediate
Long	1
Very Long	4
Distant	10

Note that the above rounds-to-impact numbers are for missiles with Thrust 10. Advanced missiles have Thrust 15 and must be calculated separately (see the Missile Flight Times table on page 37)

Apply the ship's Salvo Defence score, recorded on its Fleet Combat Ship Sheet, against incoming missiles. After determining how many missile and torpedo weapons successfully reach their target, pDetermine damage by the following:

- Obtain the base Damage value of the missiles or torpedoes, listed in the Fleet Combat Missile and Torpedo Damage table on page 36.
- Subtract the target ship's Armour from the adjusted Damage value.
- Multiply the adjusted damage by the number of missiles that detonate on target.

SCREEN DEFENCE

Points from the meson screen pool may be applied to reduce the damage from any meson attacks. They also remove the Radiation trait of each attack to which points are applied.

Points from the nuclear damper pool may be applied to reduce the damage from any nuclear missile, nuclear torpedo or fusion weapon attacks. They also remove the Radiation trait of each attack to which points are applied.

Screen pools are expended each round and are replenished to their full amount in the following fleet combat round provided that the screens have not been disabled or destroyed.

SANDCASTER DEFENCE

Sandcasters reduce the amount of damage incurred from laser, energy (fusion and plasma guns) and particle beam weapons. To determine the damage reduction, add the Crew Skill score to the ship's Defensive DM and then subtract the opposing ship's Offensive DM to obtain the Sandcaster Effectiveness score.

Sandcaster Effectiveness

Score	Multiplier
0 or less	0.5
1–2	0.75
3+	1

Multiply the Sandcaster score listed on the Fleet Ship Sheet by the multiplier in the table above to obtain a pool of points that the ship can use to reduce any laser, energy or particle beam damage incurred in battle.

SPECIAL WEAPONS

Some weapons have special effects beyond their normal damage-dealing capabilities. These cases are described here.

Antiradiation Torpedo: A target's Defensive DM is halved (round down) against a salvo of these torpedoes.
Meson Weapons: These weapons do not have their damage reduced by a target's Armour. The Radiation trait from meson weapons ignores the Antirad trait.
Multi-warhead Missiles/Torpedoes: Reduce the target's Salvo Defence by 20% against this weapon.

CRITICAL HITS

Critical hits occur after each 10% increment of a ship's adjusted hull points are depleted. Offensively superior ships with well-trained crews can score additional Critical Hits. Add the Offensive DM to the Crew Skill score of the attacking ship and subtract the Defensive DM of the target ship. If the total is four or higher, an additional Critical Hit is scored on the target ship. However, these Critical Hits are nullified under the following circumstances:

- Ships larger than 2,000 tons ignore critical hits from turrets and barbettes.
- Ships larger than 10,000 tons ignore critical hits from all weapons except medium and large bay weapons and spinal mount weapons.
- Ships larger than 100,000 tons ignore critical hits from all weapons except large bays and spinal mount weapons.
- Spinal mount weapons can cause critical hits on ships of all sizes.

Critical Hit Effects

	Severity					
Location	**1**	**2**	**3**	**4**	**5**	**6**
Sensors	Sensors damaged. Offensive DM reduced by -1.	Random sensor disabled.	Random sensor destroyed.	Sensor station links damaged. Offensive DM reduced by -2.	Sensors disabled. 2D% sensor operators injured. Unable to target opposing ships.	Sensors disabled. 2D% sensor stations destroyed. Unable to target opposing ships.
Power Plant	Thrust reduced by -1 or 1 sensor or weapon system offline.	Thrust reduced by -1 and 1 sensor or weapon system offline.	Thrust reduced by -2 and 2 sensor or weapon systems offline.	Power disabled. Thrust, sensors and weapons offline.	Power disabled, Hull Severity increased by +1.	Power destroyed, Hull Severity increased by +1D.
Fuel	Leak – lose 1D% tons of fuel per hour.	Leak – increase loss by 1D% tons of fuel per hour.	Leak – lose 1D x 10% of fuel.	Fuel tank destroyed.	Fuel tank destroyed. Hull Severity increased by +1.	Fuel tank destroyed. Hull Severity increased by +1D.
Weapon or Screen	Random system suffers DM-1 when used.	Random system disabled.	Random system destroyed.	Random system explodes, Hull Severity increased by +1.	D3 random systems destroyed, Hull Severity increased by +1.	1D random systems destroyed, Hull Severity increased by +1.
Armour	Armour reduced by -1. Recalculate rating.	Armour reduced by -D3. Recalculate rating.	Armour reduced by -1D. Recalculate rating.	Armour reduced by -1D. Recalculate rating.	Armour reduced by -2D. Recalculate rating. Hull Severity increased by +1.	Armour reduced by -2D. Recalculate rating. Hull Severity increased by +1.
Hull	Adjusted Hull Points incur 1D% damage. Round up.	Adjusted Hull Points incur 2D% damage. Round up.	Adjusted Hull Points incur 3D% damage. Round up.	Adjusted Hull Points incur 4D% damage. Round up.	Adjusted Hull Points incur 5D% damage. Round up.	Adjusted Hull Points incur 6D% damage. Round up.
M-Drive	Thrust reduced by -1.	Thrust reduced by -1.	Thrust reduced by -2.	Thrust reduced by -2.	M-drive disabled.	M-drive destroyed.
Cargo	10% of cargo destroyed.	1D x 10% of cargo destroyed.	2D x 10% of cargo destroyed.	All cargo destroyed.	All cargo destroyed, Hull Severity increased by +1.	All cargo destroyed, Hull Severity increased by +1.
J-Drive	J-drive checks incur DM-1.	J-drive checks incur DM-2.	Jump drive disabled.	Jump drive disabled, Hull Severity increased by +1.	Jump drive destroyed, Hull Severity increased by +1.	Jump drive destroyed, Hull Severity increased by +1.
Crew	1D% of crew take 1D damage.	2D% of crew take 2D damage.	3D% of crew take 3D damage. Crew Skill score reduced by -1.	Life support fails within 1D hours.	Life support fails within 1D rounds.	Life support fails.
Bridge	Random bridge station disabled.	Computer reboot: All software unavailable for 2 rounds.	Computer partially disabled. Reduce bandwidth by 50% until repaired.	Random bridge station destroyed. Occupant takes 3D damage.	Computer disabled and random bridge station destroyed. Occupant takes 3D damage.	Random bridge station destroyed. Occupant takes 3D damage. Hull Severity increased by +1

Whenever a Critical Hit results, first roll on the Critical Hit Location table and then check the results on the Critical Hit Effects table. Each successive hit on the same location increases the Severity by +1.

Critical Hit Location

2D	Location
2	Sensors
3	Power Plant
4	Fuel
5	Weapon
6	Armour
7	Hull
8	Manoeuvre Drive
9	Cargo
10	Jump Drive
11	Crew
12	Bridge

CRITICAL HIT DETAILS

Critical Hits have various effects on the performance of major ship systems. Some result in a reduction in performance, such as reducing the DM with respect to one or more weapon or screen systems or the function of the jump drive. Others reduce capacity, such as a percentage of fuel, cargo or number of sensor stations.

When a system is listed as disabled, it can be temporarily repaired during the Actions Step of the following round. When a system is listed as destroyed, it cannot be repaired or replaced until the ship is taken to a base or shipyard.

Armour reductions are made to the original armour value of the ship. After reducing the Armour rating, recalculate it for the purposes of fleet combat as described in Fleet Evaluation.

RADIATION

Ships with the Antirad trait are immune to the Radiation trait of all weapons except meson guns. In addition, meson screens nullify the Radiation trait of meson weapons and nuclear dampers nullify any Radiation incurred from nuclear fusion weapons to which they are applied.

Ships affected by the Radiation (i.e, ships that do not have the Antirad trait or relevant screen protection) suffer the effects described in the following table.

SPECIAL CASE: REPULSORS

For the purposes of fleet combat, repulsors are expected to be used for missile and torpedo defence. However, if repulsors are used as tractor beams, they double the damage to all targeted ships. Since repulsors can only be used on ships in the sub-1,000-ton range, this is a niche case but bears mention in the event that creative fleet admirals want to put them to this use.

Radiation Effects

Number of Radiation Exposures	Effect
1	Reduce Crew Skill score by -1.
2	Reduce Crew Skill score by -2, reduce laser turret, repulsor and electronic warfare salvo defence by 25% and eliminate one weapon system.
3	Reduce Crew Skill score by -3, reduce laser turret, repulsor and electronic warfare salvo defence by 50% and eliminate two weapon systems.
4	Reduce Crew Skill score by -4, reduce laser turret, repulsor and electronic warfare salvo defence by 75% and eliminate three weapon systems.
5	Ship crew essentially disabled and ship can no longer function.

ACTIONS STEP

Unlike in space combat, in fleet combat most actions are automatic and do not require dice rolls. However, there are several actions and checks that can be made, depending on the circumstances.

REPAIR SYSTEM

Each round, a ship's crew earns a number of Repair Points equal to twice its Crew Skill score plus its Auto-Repair score. Repair Points can be used to repair systems that have been affected by Critical Hits on a point-for-point basis. For example, a ship with a Crew Skill score of 2 and Auto-Repair/2 software earns 6 Repair Points per round. If their ship suffers two level 1 Critical Hits and two level 2 Critical Hits (a total of 6 levels), they can use their 6 Repair Points to fix all of the affected systems. Repair points revert to zero at the end of each round.

BREAKING OFF

Breaking off from battle occurs when one side decides to exit the battle. A fleet that breaks off from a battle incurs DM-1 to its Defensive DM and may not use spinal mount weapons for the duration of the action. A breaking off action ends when the departing fleet either gets beyond the attack range of the opposing fleet or jumps out of the system.

DISPERSING AND REASSEMBLING A FLEET

Depending on the objectives of a fleet battle, it might become necessary to disperse the fleet into multiple smaller fleets or even individual flotillas or squadrons. Dispersing the fleet is a complex action that requires multiple ships to break formation and reform into smaller tactical groups. Doing so requires a task chain. First make an Average (8+) Leadership check and then a subsequent Difficult (10+) Tactics (naval) check, adding the Task Chain DM. See the Fleet Dispersal table for the results.

Note that other actions cannot be taken by ships participating in a dispersal or reassembly.

Fleet Dispersal

Effect	Result
-1 or less	Failure. The ships of the fleet suffer DM-2 on their Offensive and Defensive DMs for 2 rounds, after which they may reattempt the manoeuvre.
0	Success. Action requires 3 rounds, during which Offensive and Defensive DMs are reduced by -1.
1–2	Success. Action requires 2 rounds.
3+	Exceptional Success. Action requires 1 round.

A dispersal can result in the rearrangement of the fleet into a virtually unlimited number of smaller groups. In naval parlance, fleets are dispersed into squadrons and squadrons into flotillas. It is assumed that the typical navy drills and prepares for such events but the execution of a dispersal is still complex and therefore requires leadership and execution.

After a dispersal, the ships are divided into separate fleets, flotillas, squadrons or other derivatives of the original fleet. Create separate Fleet Sheets for each newly formed unit. Should the dispersal result in the extraction of a very small group, perhaps 1–3 ships, and that group includes one or more of the Travellers, the Referee should consider using the normal space combat rules instead of the fleet combat rules presented in this chapter for the actions of the new unit. While the fleet combat rules scale for just about any encounter, the standard space combat rules provide more detailed results.

Should the fleet commander desire a return to the original formation or acquire ships from other fleets, a fleet reassembly action is required. Simply make the Leadership and Tactics (naval) checks as described and consult the Fleet Dispersal table for the results. A successful reassembly action returns the fleet to its original formation, a new formation with different fleet elements or incorporates newly acquired ships.

MORALE

Fleet combat deals with large numbers of ships, each with their own commanding officers and crews. As such, the course of a battle can affect morale, both positively and negatively, depending on the events that occur. A Morale check must be made each round, potentially resulting in changes to the Crew Skill score of all of the ships in a fleet for that round. Morale-affecting events and their associated DMs include the following:

- +1 if 50% or more of the ships in the opposing fleet are eliminated.
- +1 if the opposing flagship is eliminated.
- -1 for each 25% of one's own ships that are eliminated.
- -1 if own flagship is eliminated.

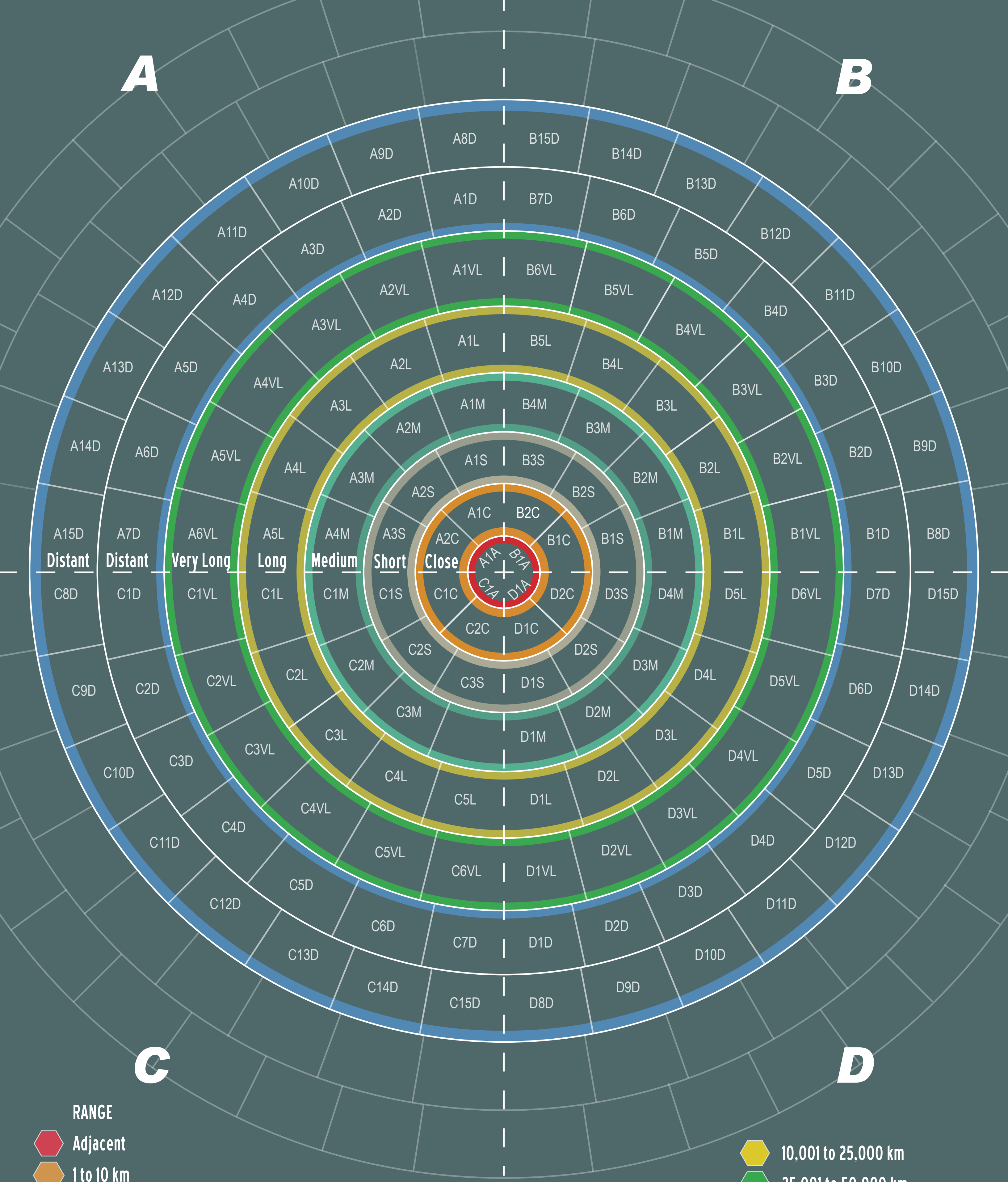
FLEET MANOEUVRES

When using the Fleet Manoeuvre Chart, the Referee must select a 'fixed' point in space around which all ships and squadrons manoeuvre. This may be a planet or moon, a space station or perhaps a convoy travelling at a fixed velocity. This fixed point is the centre of the chart.

Each ring around the fixed point represents a Range Band, allowing you to plot the distance of any ship in relation to the fixed point.

The chart is divided into quadrants and each Range Band within a quadrant is divided into sectors (not to be confused with the sector maps used to chart star systems). These allow you to plot the position of ships relative to the fixed point and one another.

FLEET MANOEUVRE CHART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B
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B14D
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B4M
A3L
B3L
A2M
B3M
A14D
A6D
A5VL
B2VL
B2D
B9D
A4L
B2L
A1S
B3S
A3M
B2M
A2S
B2S
A1C
B2C
A15D
A7D
A6VL
A5L
A4M
A3S
A2C
B1C
B1S
B1M
B1L
B1VL
B1D
B8D
Distant
Distant
Very Long
Long
Medium
Short
Close
A1A
B1A
C1A
D1A
C8D
C1D
C1VL
C1L
C1M
C1S
C1C
D2C
D3S
D4M
D5L
D6VL
D7D
D15D
C2C
D1C
C2S
D2S
C2M
D3M
C3S
D1S
C2L
D4L
C9D
C2D
C2VL
D5VL
D6D
D14D
C3M
D2M
D1M
C3L
D3L
C3VL
D4VL
C10D
C3D
D5D
D13D
C4L
D2L
C5L
D1L
C4VL
D3VL
C4D
C11D
D4D
D12D
C5VL
D2VL
C6VL
D1VL
C5D
D3D
C12D
D11D
C6D
D2D
C7D
D1D
C13D
D10D
C14D
D9D
C15D
D8D
C
D

RANGE

⬢ Adjacent
⬢ 1 to 10 km
⬢ 11 to 1,250 km
⬢ 1,251 to 10,000 km
⬢ 10,001 to 25,000 km
⬢ 25,001 to 50,000 km
⬢ 50,001 to 300,000 km

For example, a cruiser has entered a system with orders to track down and destroy a squadron of corvettes. The cruiser is in C Quadrant, Sector 3, at Distant range (you could abbreviate this to C3D). The squadron of corvettes is on the other side of the system in A Quadrant, Sector 1, at Medium Range (A1M).

MOVEMENT

To move around the Fleet Manoeuvre Chart, a ship may either change its Range Band (moving inwards or outwards from the fixed point) or move around the fixed point within the same Range Band.

Ships may change Range Bands by expending Thrust as normal, following the rules described in Movement, above. So, if a fleet were at Very Long Range, its ships must expend 25 Thrust to change their range to either Long or Distant. The vector of a fleet may also be considered. For example, to remain in the target range band, the ship must also use Thrust to reduce speed lest they continue beyond the target location.

Ships may move to an adjacent Sector in the same Range Band by expending the same amount of Thrust.

For example, the squadron of corvettes we met before are currently at Medium range in Sector 1 of the A Quadrant. They could expend 5 points of Thrust to move to either Close or Long range in the A Quadrant (moving to either Sector 1 or 2 at Long range, as both are adjacent to their starting position), or they could expend 5 points of Thrust to move around the fixed point, to either Sector 2 at Medium range, or Sector 2 at Medium range in the B Quadrant.

ATTACKS

Attacking another ship or squadron using the Fleet Manoeuvre Chart is done in the same way as normal for the Fleet Combat system. However, the Fleet Manoeuvre Chart allows you to determine the range to a target. This is determined by the position of the attacking fleet relative to its target.

Missile Salvoes

The Fleet Manoeuvre Chart can also be used to track the movement of missile and torpedo salvoes en route to their targets.

Salvoes can be tracked and moved as if they were ships, albeit with a lot more Thrust to move across the chart. Referees should assume they will always move along a path that requires the least amount of Thrust.

CELESTIAL TERRAIN

Objects in space may become part of the ‘battlefield’ in fleet combat. Such objects include gas giants, rocky planets, planetoids and space stations. Under specific circumstances, a fleet is entitled to certain benefits due to proximity with such objects.

A fleet may use a gas giant or rocky planet as an obstruction, provided it is using superior Thrust and remains within Adjacent to Short range of the planet. Doing so provides Defensive DM+1 for each point of Thrust superiority. Essentially, this means that the fleet is using the object as an impediment against enemy attacks.

While far too small to provide protection for a full fleet, a fighter squadron may use a planetoid of reasonable size (one kilometre or larger in diameter), a space station or similarly sized object in the same manner. However, this might put said objects in jeopardy if the opposing fleet decides to ‘shoot through’ the object if it has the firepower to do so.

BOARDING ACTIONS

Being boarded can be as simple as giving another spacecraft permission to dock and then allowing an officious boarding party to come inside for a cursory inspection or, at the other extreme, a tooth-and-nail pitched battle that starts at space-combat range and ends in a room-to-room firefight within the ship.

The description presented here is, in some ways, an abbreviated version of the one presented in the *Specialist Forces* book. The phases listed here are the same but the approach is more general, not focused on the actions of a mercenary unit or usage of specialised equipment. The two sets of rules are not mutually exclusive and can be combined if desired.

CONDUCTING A BOARDING ACTION

Boarding actions may be resolved with the abstract system presented on page 175 of the *Traveller Core Rulebook*, or by using the guidance provided in this chapter, or that in *Specialist Forces*. The method chosen should reflect the desired outcome. If the Travellers are not involved in the boarding action, the abstract system might work best. However, if the Travellers are involved in the boarding action on one side or the other, more detail might be necessary – and fun!

REQUIREMENTS

Boarding actions require the ship that is to be boarded to be inert or restrained from making evasive actions. This means that the ship is not operating its manoeuvre drives voluntarily or due to disablement. Routine inspections occur when a ship voluntarily allows itself to be boarded. Forced boarding occurs when the crew of the boarded ship resists. Forced boarding can be performed even while both ships are using thrust under the following conditions but even then it might result in damage to both spacecraft:

- The attacking ship must be able to apply more Thrust than the ship to be boarded. A ship that has Thrust parity or superiority can, in theory, evade boarding indefinitely.
- The attacking ship must have a means to get into the ship after docking, linkage or spatial parity has been established. The latter occurs when the two ships have – for whatever reason – ceased manoeuvring and evading one another and, therefore, boarding can proceed.

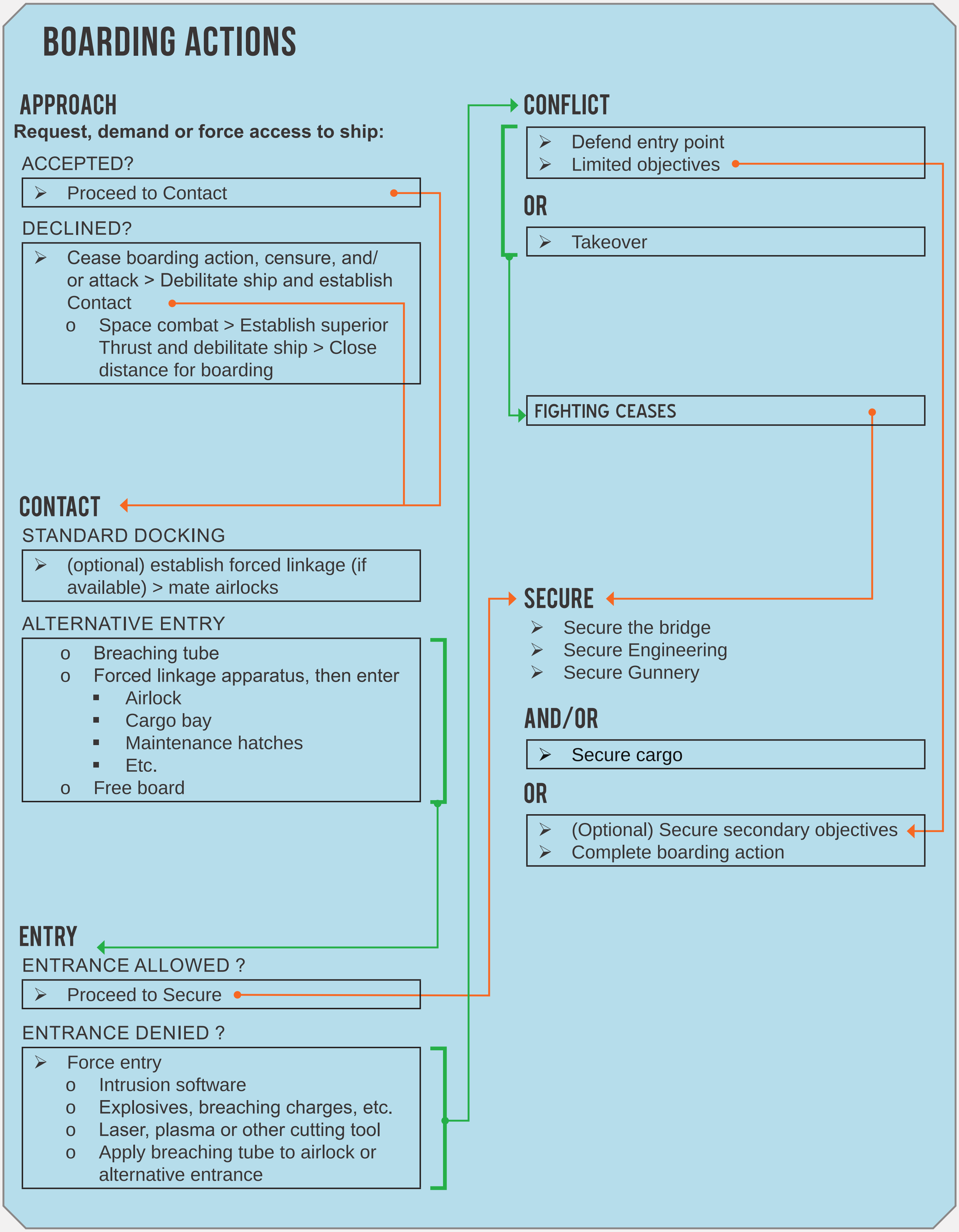
There is a third type of boarding action that is not covered in this chapter: salvage or exploratory operations. A derelict or disabled ship may be boarded using some of the mechanics described here but such actions do not require all of the listed phases. Approach, contact and entry are assumed and conflict only occurs if someone… or some*thing,* unexpected is discovered aboard the ship.

ROUTINE INSPECTIONS

There are many types of boarding actions but each starts with the approach of a ship, linkage of the two ships and contact between members of each ship's crew. Boarding actions are rarely welcome and, even if expected, they are typically a diversion from the Travellers' ultimate goal: arrival at a starport, a meeting with another ship, departure from a world or some other objective.

Boarding actions are frequently carried out by naval and marine personnel, whose responsibilities include the security of the space around a world, orbital starport or another item of strategic value. Being boarded by the navy is standard fare for most spacers, a minor inconvenience to be tolerated en route to whatever destination awaits them. Boarding parties vary with the size and type of ship being boarded. Small ships, in the 100- to 1,000-ton range, typically warrant a party of 4–12. Some boarding parties bring one or more robots as well, some of which might be armed but others with only sensory devices. The compositions of such teams varies. If they hail from a powerful navy with a large budget, such as the Imperial Navy, then several members of the party will be well-armed and armoured, possibly including 2–4 marines in boarding vacc suits, combat armour or even battle dress. Imperial Navy personnel wear naval vacc suits such as that depicted on page 71 of *Element Cruisers*. If, however, the boarding party hails from a small planetary navy with a limited budget and jurisdiction, their equipment might be less impressive.

BOARDING ACTIONS



APPROACH

Request, demand or force access to ship:

ACCEPTED?

- ➢ Proceed to Contact

DECLINED?

- ➢ Cease boarding action, censure, and/or attack > Debilitate ship and establish Contact
  - o Space combat > Establish superior Thrust and debilitate ship > Close distance for boarding

CONTACT

STANDARD DOCKING

- ➢ (optional) establish forced linkage (if available) > mate airlocks

ALTERNATIVE ENTRY

- o Breaching tube
- o Forced linkage apparatus, then enter
  - ▪ Airlock
  - ▪ Cargo bay
  - ▪ Maintenance hatches
  - ▪ Etc.
- o Free board

ENTRY

ENTRANCE ALLOWED ?

- ➢ Proceed to Secure

ENTRANCE DENIED ?

- ➢ Force entry
  - o Intrusion software
  - o Explosives, breaching charges, etc.
  - o Laser, plasma or other cutting tool
  - o Apply breaching tube to airlock or alternative entrance

CONFLICT

- ➢ Defend entry point
- ➢ Limited objectives

OR

- ➢ Takeover

FIGHTING CEASES

SECURE

- ➢ Secure the bridge
- ➢ Secure Engineering
- ➢ Secure Gunnery

AND/OR

- ➢ Secure cargo

OR

- ➢ (Optional) Secure secondary objectives
- ➢ Complete boarding action

Boarding parties expect to enter a ship via its primary airlock, although exceptions can be made depending on the circumstances. Most boarding parties seal the door to their own ship after inserting the boarding party. The fact is, no matter how innocuous the ship they are inspecting might appear, they cannot fully know what to expect once they are inside. Boarding parties usually find themselves inspecting a marginally well-maintained ship with a semi-competent crew who are doing what they can to keep the ship flying but there is always the chance that they are interstellar pirates, terrorists or other malcontents who could be armed and dangerous. Boarding parties must be prepared for this possibility because their lives might very well depend upon it. Preventing a ‘reverse boarding’ by sealing the airlock is standard operating procedure.

After the boarding party is inserted, observation of the airlock is maintained with surveillance devices from the boarding ship or with personnel placed on the inside of their own airlock door. After entering, most boarding parties place one or two guards at the airlock door of the ship they have boarded. Some close the boarded ship’s door but some – equipped with vacc suits or similar equipment – prefer to keep it open as an insurance policy, sometimes even barring it from being shut. Should things go awry, the crew of a boarded ship have their own self-preservation to think about and assaulting a boarding party with their own airlock door open does not bode well for survivability.

The remainder of the team performs whatever duty they have come to execute, including, but not limited to, the following:
- Cargo bay searches
- Bridge and transponder checks
- Crew and passenger interviews
- Engineering and fuel tank inspections

Efficient teams with enough personnel might split up to perform their duties, especially if they have two or more objectives to accomplish and want to do so in a timely fashion.

Inspections can be curt and perfunctory, taking only a few minutes, or long and arduous, taking hours or even an entire day. While most inspections are superficial, some are intrusive, requiring the opening of cargo modules, removal of bulkheads or hull plates, opening of fuel tanks and other time-consuming and invasive procedures. In the Charted Space universe, the space between worlds in the Imperium is Imperial Navy territory and they can perform detailed inspections with little in the way of legal pretext.

The tools of the trade that inspectors bring with them affect the duration of the inspection. Teams with high-tech ships might have done the majority of their inspection before even entering the ship using densitometers, life scanners and neural activity sensors. The job of the boarding party in such cases is more psychological in nature: to impose authority, intimidate or to determine the nature and motives of the ship’s crew. Other boarding parties have lower technology and might take hours since they must perform the inspection manually.

Should something go wrong during an inspection – for example, the discovery of smuggled goods, finding a harboured fugitive or aggressive behaviour from the crew – things can go sour. Well-trained boarding parties know how to reassemble quickly. If things get hot, boarding parties will attempt to regroup and the mission takes on a different approach altogether, with weapons drawn and possibly ending with arrests being made and the ship impounded and transferred to the nearest naval base or starport facility. Should this occur, the Travellers can expect to pay a heavy fine at the very least but they might even be subjected to incarceration or the loss of their ship.

Under normal circumstances the inspection happens, the boarding party returns to their ship and the two ships part ways, none the worse for wear. Over the course of a gaming session, these interactions can be glossed over but they can add to the drama of an adventure or even just a routine visit to a world. If there are political tensions or heightened Law Levels in particular star systems or even the threat of war in or nearby the system, the likelihood of being boarded increases. Any time the Travellers arrive in a new star system and make their way to the system mainworld or other key world, make an Average (8+) check to determine whether they are subjected to an inspection, adding in the following DMs:

Event	DM
Population 5-	DM-2
Law Level 0–2	DM-2
Law Level 3–5	DM-1
Law Level 6–9	DM+0
Law Level A+	DM+2
Government 7 or A+	DM+1
Naval Base present	DM+1
Amber Zone	DM+2
Red Zone	DM+4
Other (war, political strife, pandemic, etc.)	DM+1

The method of inspection should be determined by the Referee. If the world is high-tech, it might simply be a scan of their ship from Close or Adjacent range with starport or patrol spacecraft sensors. Any irregularities are likely to result in a more thorough, in-person inspection. Lower tech systems, especially those with their own navies, are more likely to take a hands-on approach from the outset.

Provided that things go well and nothing untoward is discovered in the ship, the inspection should be completed without any problems, the boarding party returns to its ship and they depart, allowing the Travellers to go on their merry way. This encounter can be resolved with roleplaying but the Referee may add several task rolls to help determine the outcome. Following are some examples.

Pulling rank to prevent a boarding party from inspecting the ship: Difficult (10+) Diplomat check (1D minutes, EDU) or Average (8+) Diplomat check (1D minutes, SOC).
Cooling things down if a disagreement occurs between the ship's crew and the boarding party: Opposed check, Persuade or Diplomat (SOC) by a member of the ship's crew vs. Leadership (SOC) by the boarding party.
Preventing a boarding party from seeing something you do not want them to see: Opposed Deception (DEX, INT or SOC depending on how the skill is used) vs. Recon (INT) check. Additional DMs may apply, depending on whether the item, person or ship feature in question is already camouflaged, concealed or otherwise obscured from view.

Routine inspections are an inconvenience for Travellers but there is no reason for them to be dull or uninformative. The exchange between the boarding party and the Travellers can give them a sense of the world they are visiting, events transpiring in the vicinity and what they can expect to happen next.

FORCED BOARDING

The Travellers' ship might be subjected to forced boarding by a variety of parties including naval patrols, pirates or corsairs, rival groups (a.k.a., 'the bad guys' in a given adventure) and others.

Naval patrols do not typically engage in a forced boarding unless provoked to do so. Circumstances under which this can happen include – but are not limited to – the Travellers evading a routine inspection, the Travellers' ship being recognised (rightly or wrongly) as one that was involved in criminal activity or the ship's transponder broadcasting conflicting data.

Pirates and corsairs board ships for obvious reasons but the differences between the two should be noted. Pirates are criminals who want to steal the Travellers' cargo (and possibly their entire ship!) for their own personal gain. Corsairs are commerce raiders, working to disrupt the flow of trade for political reasons. Both are thieves who intend to abscond with the Travellers' freight and cargo but pirates are potentially more desperate and hence dangerous, while corsairs are, on some level, soldiers in the employ of a planetary or interstellar government. The latter usually have a letter of marque that attempts to legitimise their thefts in the name of a patron government. Another difference between the two is the quality of their ships. Pirates tend to operate ramshackle spacecraft, some of which are behind on maintenance and in poor working condition.

There are certainly well-heeled pirates with much better ships (for example, the Pirate Lords of Theev from the *Pirates of Drinax* campaign) but for the most part pirate ships are not top of the line. Meanwhile, corsair ships often reflect the wealth of their patrons. While some corsairs are simply contractors, operating their own ships, others use craft bequeathed to them by their patrons. As such, corsair ships can be impressive, high-tech and well-armed, and therefore considerably more dangerous in space combat.

Other groups that might oppose the Travellers include a wide range of possibilities but are most often 'the villains' of an adventure or campaign. Their motives vary but if they plan to board the Travellers' ship, they presumably want something or some*one* aboard the ship; otherwise, they would simply attempt to destroy it.

APPROACH

The first step of a forced boarding is the approach. Space is big. If a ship can apply more thrust than that of their assailants, the encounter begins beyond the range of weapons and the ship under pursuit wants to avoid the encounter, then the Approach phase cannot begin in earnest. However, if an aggressor has superior thrust, they can close on the other ship, first coming into space-combat range, engaging in combat (if the ship under pursuit refuses to surrender) and, if victorious, closing the gap in order to board. Refer to Space Combat in the *Traveller Core Rulebook* to resolve this portion of the Approach phase. Of course, all of this is moot if one ship has enough fuel to jump and they are at safe distance from a gravity well to do so. If given the option to avoid fighting altogether, jumping out of the system or microjumping to another location within the system ends the Approach phase immediately.

TUMBLING SHIPS

Deliberately causing a ship to tumble can prevent or at least delay a boarding action. However, entering, cancelling and stopping a tumble are challenging actions.

A pilot may deliberately enter or cancel a tumble by making a Routine (6+) Pilot check (D3 space-combat rounds, DEX). During the attempt, the ship cannot manoeuvre in any other way. If the check is failed, the vessel may create some inconvenient rotation but docking or free boarding can still be attempted at DM-1. If the check succeeds, the pilot can continue to make random evasive manoeuvres without counteracting the tumble but deliberate manoeuvres are subject to a negative DM determined by the severity of the tumble. The severity of an induced tumble is rated by the negative DM applied to attempts to dock with the tumbling ship. This DM is equal to D3 for an accidental tumble caused by control loss and D3 plus the Effect of the Pilot check made to initiate a deliberate tumble. This DM is applied to any attempts to attach lines, or for personnel to get onto the hull, and conventional docking is impossible.

Correcting a tumble can be tricky. Many starship control systems have an automatic tumble cancellation system that reduces the severity of the tumble by one each space combat round but a good pilot can do it more quickly.

Make an Average (8+) Pilot check (DEX) with a negative DM equal to the severity of the tumble. If the check is made, the tumble is cancelled. If it is failed, the Effect of this check is the new severity of the tumble.

Tumbles can be stopped by opposing ships that are equipped with forced linkage apparatuses or by ramming the tumbling ship to reduce the tumble; however, only forced linkage apparatuses do so without potential harm to both ships.

Ramming a ship to reduce its tumble can be costly. The attacking ship's Pilot must make a Difficult (10+) Pilot check (DEX) to close the gap and 'gently' ram the target ship. Failure results in damage to both ships equal to damage dice of 2 + the negative Effect as a positive modifier. For example, a failure with an Effect of -1 results in 3D damage. Armour reduces damage as normal. Each successful ramming action reduces the tumbling severity by one, regardless of the Effect of the Pilot check.

Such encounters might begin with radio contact. This is an opportunity for roleplaying. The crew of the opposing ship might declare their intentions… or not. Communications offer the Travellers the chance to determine their opponents' objectives before a conflict occurs. Harsh words and bold claims can make the encounter a rich one. Should the Travellers turn the tables on their would-be assailants, then *they* can become the ones forming a boarding party if they so desire.

Regardless of who boards whom, the Approach phase begins with space combat – or the avoidance thereof – and ends when one ship has been subdued, unable or unwilling to apply Thrust, and therefore powerless to prevent a boarding action.

CONTACT

The Contact phase is the final step before actual boarding begins. Typically, Contact occurs when one ship is linked to another by mating airlocks or creation of an entry point by using a breaching tube, breaching charges, spacecraft weapons or other means. Alternatively, Contact may occur via a free-boarding exercise, in which vacc-suited or armoured boarders make the leap from their own ship to the ship they intend to board and then enter through a standard aperture (for example, an airlock, cargo bay doors or maintenance hatch) or create one using weaponry or explosives. Free boarding is extremely dangerous but well-trained teams can pull it off. The advantage of free boarding is that it reduces the threat of damage to one's own ship or the possibility of being 'reverse boarded' after losing the fight during the Conflict phase.

While the crew of a ship being boarded may have given up on using thrust to get away or prevented from doing so due to a damaged or disabled manoeuvre drive, there are still mischievous – if potentially costly – ways that they can stave off a boarding party. Most ship's weapons are highly ineffective against small targets such as a free-boarding party but sandcasters can be used against them with deadly results. Clever engineers can engage the life support system to violently eject air from various portals in order to create minor position adjustments, thereby making it difficult to board and possibly colliding with the opposing ship if it draws close. Moves like this are desperate and often serve only to invoke the ire of the boarding party but people do irrational things under pressure. Furthermore, if the ship being boarded does not know the intentions of the boarding party, last-ditch or seemingly suicidal moves begin to make more sense.

If the boarding ship has committed to establishing a physical connection before boarding, a forced linkage apparatus (see page 57) is a highly effective tool to prevent mischief by the crew of the opposing ship. While it is not fool proof, this tool increases the chances for a successful Contact, adding DM+2 to further steps that will achieve Contact; for example, linking an airlock, which requires an Average (8+) Pilot check.

ENTRY

The simplest entry between two ships is via a pair of mated airlocks. If this is the route taken, the boarding party makes their way to the opposing ship's airlock door and, if allowed to enter, simply walk through the door after it is opened. However, forced boarding is rarely that easy. There is the danger of booby-trapped airlocks for one (see page 59). Wily ship captains may have all sorts of surprises arranged for prospective invaders.

More often than not, the boarding party must only overcome a single impediment: a locked door. Following are ways to get through a locked airlock door or other portal or surface.

Force an airlock door open with mechanical tools: Formidable (14+) Mechanic check (2D rounds, STR). After a successful check, an additional 1D rounds are required to get the door fully open using a crowbar or similar tool, exposing the boarding party to the dangers of attacks through the gap.
Force a maintenance hatch or cargo door open with mechanical tools: Very Difficult (12+) Mechanic check (2D rounds, STR). Getting in these types of doors is usually easier than an airlock but may result in explosive decompression if atmospheric life support has not been evacuated to storage tanks.
Breach the ship with personal weaponry: Routine (6+) Gun Combat (energy) check (DEX) or Average (8+) Gun Combat (slug) check (DEX). Short or close range is required, with no range bonuses since the target for a breach must be very small. The difficulty does not reflect how hard it is to target the ship but the danger to the attacker. If failed, the Traveller takes 1D damage for every negative point of Effect. This reflects ricochets or energy blowback. Firing at greater range eliminates this danger but requires higher difficulty checks since any successful breaching attempt requires repeated pinpoint accuracy. Using weaponry is a rather ham-fisted way to breach a ship but if no other options are available, it is ultimately viable. See the Resilience of Starship Components table for how many rounds must be accurately fired to breach ship doors and surfaces.

If boarders are committed to using weaponry to breach a ship, ship's weaponry (for example, a pulse laser turret) is far more effective but can cause more damage than desired. Keep in mind that these weapons inflict spacecraft-scale damage, as described in the *Traveller Core Rulebook*. If the damage they inflict is high enough, a critical hit might also be registered, which can produce unexpected results.

Use a cutting tool to penetrate a door or create a breach: Average (8+) Mechanic check (DEX). See the Cutting Tools table for the Tech Level, cut rate and cost of each tool. A cutting tool removes its Cut Rate in Resilience each round +1 for every point of Effect. For example, a rescue cutter has a base cut rate of 3. The Traveller rolls a 9 (Effect +1) on their check, giving them a total cut rate of 4 per round.

Breaching a ship that has not evacuated its atmospheric life support into storage tanks can have explosive consequences. Crew on military ships don vacc suits and store their air supply prior to reporting to battle stations. Most civilian ship captains are aware of the dangers but due to the rarity of space combat for most of them, many do not adequately prepare for explosive decompression. Prudent ones evacuate key sections of the ship at the very least including the cargo hold and engineering sections. The bridge, common area and accommodations sections often retain their atmospheres despite the hazard. Most crews are knowledgeable enough that they put vacc suits or

Resilience of Starship Components

Component	Resilience (Holed)	Resilience (Practicable Breach)
Hatch, Unarmoured Ship	4	15
Airlock Door, Unarmoured Ship	6	25
Hatch, Armoured Ship	6+ 1 per point of Armour	25 + 1 point of Armour
Airlock Door, Armoured Ship	10 +1 per point of Armour	35 + 1 per point of Armour
Hull, Unarmoured Ship	50	250
Hull, Armoured Ship	100 + 10 per point of Armour	400 + 20 per point of Armour

Cutting Tools

Type	TL	Cut Rate	Cost	Description
Emergency Cutter	10	1	Cr1000	Basic light hull-cutting device. Most starships have one in their ship's locker for emergency operations.
Rescue Cutter	9	3	Cr3000	A standard hull-cutting device, typically carried by rescue ships and military vessels for emergency use.
Heavy-Duty Cutter	11	6	Cr5000	A powerful plasma cutter typically mounted on a powered platform or sometimes carried as a backpack.
Assault Cutter	12	8	Cr6000	A group of cutting devices designed to work together for a rapid breach.
Advanced Cutter	+2	+2	+25%	Two Tech Levels after the basic model becomes available, an advanced variant of each tool type with greater power appears. Cost is 25% greater.

BOARDING PARTY WEAPONS AND ARMOUR

The weapons of choice for a boarding action are blades and handguns. For a handgun, most boarding parties prefer snub pistols or laser pistols for two reasons: both have the Zero-G trait (indicating that they have no recoil) and neither do extensive damage to ship systems when shots are missed.

Weapons with recoil often turn out to be a bad choice. If the power plant goes offline, life support systems are damaged or artificial gravity has been deliberately turned off and therefore no gravity is present, weapons without the Zero-G trait can send their users careening off the bulkheads of a ship, possibly injuring themselves or their unfortunate teammates as stray shots become friendly fire.

Most ships are too cramped for long guns to be effective but when boarding parties want a little more punch, they often choose the accelerator rifle (which also has the Zero-G trait), laser carbines or similar small weapons. During a boarding action, these mid-sized weapons incur DM-1 when fired due to the difficulty of using even a compact long gun in the tight spaces of a ship. Any long gun larger than a carbine such as an assault rifle, advanced combat rifle or laser rifle incurs DM-2 when fired. Heavy weapons are virtually impossible to use, incurring DM-4.

While hand grenades can be used during a boarding action, they are highly random and destructive, and might cause a lot of unexpected damage. There is also a great deal of danger in ricochets or poorly thrown grenades, which can end up being detonated amidst one's allies instead of their intended targets. Most participants on either side of a boarding action do not use grenades for the above reasons.

Most members of a typical boarding party also carry a blade of some sort. In the Charted Space universe, the blade of choice is the cutlass, favoured for its heft, striking power and curved blade, which makes it easier to use in tight spaces. The broad flat portion of the cutlass also enables it to be used as a bludgeon or a tool to move aside small objects and open doors. A blade or dagger will do in a pinch but neither is as effective as the cutlass.

Armour selection is also important. The boarding vacc suit is preferred since it provides good Protection and does not hinder movement. The combat environment suit is a decent alternative but fails within D3 x 10 minutes in full vacuum. Heavier choices like combat armour and battle dress certainly provide more Protection but both make it difficult to navigate the tight spaces of a ship. Wearing combat armour causes DM-1 to all physical actions during boarding actions and battle dress incurs DM-2. Should the threat be significant enough to warrant enhanced protection, a boarding party might select heavier armour despite the disadvantages but most opt for something lighter.

vacuum-sealed armour on and a ready supply of soft suits should be on hand for passengers and anyone else who does not have a vacc suit.

These things should be taken under consideration when breaching a civilian ship. The Referee should roll 2D: on a result of 2–8, the ship's atmosphere has been properly stored but on 9–12, the breached section retained its atmosphere and sudden decompression occurs. Refer to Atmosphere and Vacuum in the *Traveller Companion* for more information on what can happen.

Using a breaching tube to enter a ship effectively creates a sealed passageway, thereby preventing a decompression event regardless of the fact that the tube has just created a sizable hole in the ship. Breaching tubes are fast, usually cutting through the outer hull of an unarmoured ship in under two minutes, scarcely giving its crew time to react. If an uninhabited part of the ship is targeted, the boarding party can often be inserted before the crew of the ship has time to figure out where the breach is being made, arm themselves and get to the site in time to oppose them.

CONFLICT

If a boarding party must go to the trouble of forced entry into a ship, then some form of conflict with its crew is inevitable. Fighting aboard a ship is dangerous. While the hull can withstand dozens of shots from most slug or energy weapons, there are a great many delicate components within a ship that cannot. In addition, the tight corridors on most ships are prone to ricochets, fire and chemical hazards, and the possibility – however remote – that liquid-hydrogen fuel lines could be ruptured, causing a catastrophic explosion.

A well-trained boarding party has clear objectives and a plan to achieve them. If the objective is to take the ship, then there are several key areas that must be taken:

- The bridge and other control centres
- Engineering
- Turrets and fire control stations

The bridge is the most critical target since controls are present for all other sections of the ship. Getting to the bridge enables a boarding party to shut down all systems if they have access to its controls. Access to controls on most ships is almost always secured in some fashion, including biometric locks and, at the low end of technology, passwords. Most security systems can be overridden by using Intrusion software (refer to the *Central Supply Catalogue*), especially if employed by a skilled operator with Electronics (computers) skill and software of a higher Tech Level than that of the ship's computer (add DM+1 for each level of difference).

If bridge controls are used to shut down controls in other areas of a ship, the instruction can be overridden. Some ships have all security removed so that a trusted engineer simply asks for an override in the engineering section and it is granted. Others are secure and require more of an effort.

To override bridge control from elsewhere in the ship: Formidable (14+) Electronics (computers) check (1D minutes, EDU). Success results in local control being returned to the individual section.

For example, someone in Engineering can reacquire local control of the drives, power plant and life support systems of the ship. Note that this is limited to the individual section, so someone in engineering cannot then obtain control of the ship's turrets, or vice versa.

If the objective of the boarding party is more limited – for example, acquiring a specific item from the cargo hold, extracting a prisoner or capturing a specific individual – then all of the ship's controls might remain in the hands of the crew and may be used against the boarding party. If acquisition of the bridge is not an objective of a boarding action, the boarding party must be prepared to deal with that lack of control. Breaking through locked iris valves, deactivated gravity in specific ship sections and other problems must be dealt with as they arise.

Armed combat aboard a ship has two important features that require further description: stacking and missed shots. Stacking is the order in which the boarding party or ship's crew – or segment thereof – are arranged. Depending on which side an attack comes from, the first or last person in line receives the bulk of the attacks.

After a successful roll to hit, roll 2D. On a 9 or less the first target in the stack is hit. On a 10–12, the round hits another member of the group. Likewise, if a specific target is desired in a group, the attacker must overcome the stacking. Use a variation of the same mechanic: the attacker must roll 10+ on 2D to aim at anyone other than the front target in the stack; otherwise, the front person becomes the target before rolling to hit.

Missed Shots

2D	Target
1–3	The round bounces back and hits a randomly determined member of the attacking group on an 8+.
4–5	The round ricochets and hits a randomly determined member of the opposing group on an 8+.
6–8	Minor system damaged (for example, ceiling lights, door controls and so forth.)
9–10	The round embeds in a non-critical item (for example, furniture, a wood wall panel and so forth.)
11–12	Critical system damaged (for example, airlock door control, fuel line, bridge controls and so forth.)

Missed shots embed in a soft target or hit *something* in the ship after ricocheting. Unless the circumstances are unusual, such as a battle in an open cargo hold, fired rounds must strike a target. Hard targets, such as bulkheads, cause a ricochet that might result in an unexpected target being hit. Soft targets can be other members of the boarding party, control systems, furniture or any number of other items that can absorb a round from a weapon. Ricochets might even bounce back and hit the attackers. See the Missed Shots table.

Ships with armoured bulkheads (see page 43) reduce the potential for damage to ship's systems. Apply DM-1 to rolls on the Missed Shots table if armoured bulkheads are present where a firefight occurs.

The consequences of a missed shot that hits a minor or critical system are not always immediately felt. For example, damaged ceiling lights might flicker without turning off immediately or a round that punctures a fuel line might cause a slow leak that does not cause major damage until later. The type of weapon inflicting the damage should also be taken into consideration. If the round comes from an accelerator rifle or other light slug weapon, the damage is relatively minor and might not do much to the system other than make it faulty. However, a shot from a laser rifle or heavier weapon is likely to cause more immediate consequences. The Damage Thresholds table provides guidance.

Damage Thresholds

Damage of Weapon	Results
1–3D	Minor systems are damaged but may be repaired with an Average (8+) Mechanic check (2D minutes, EDU) provided spare parts are available. Critical systems are superficially damaged but remain functional.
4–5D	Minor systems are destroyed and require complete replacement. Critical systems are damaged but may be repaired with an Average (8+) Mechanic check (1Dx10 minutes, EDU) provided spare parts are available.
6D+	Minor systems are destroyed and require complete replacement. Critical systems are damaged, will result in additional problems (hull or fuel-line link, critical controls offline and so forth) and must be completely replaced.

Note that grenades or weapons with the Blast trait automatically register a Damage Threshold of 6D+.

FUEL SYSTEMS

Fuel takes up an inordinate amount of space on most starships, increasing with jump capability. Small craft, which carry very little fuel, do not share this characteristic. On a ship out of the factory, fuel tanks, lines and control systems are concealed from view and access but over time, access panels, repaired or reinforced lines and other components can become exposed and therefore vulnerable. The danger should not be overstated. Only the faultiest, most poorly maintained ship has multiple points of exposure to its fuel system, but the severe impact of a rupture makes it worth mentioning. Boarding actions end quickly when a fuel explosion incinerates both the boarding party and crew of the ship simultaneously.

Fortunately, most fuel systems have baffles, sectioning the tanks into compartments, so if a rupture and subsequent explosion occurs, the damage is limited. In vacuum, fuel explosions inflict 8D damage with Blast 10, which typically consumes an entire compartment in a starship of under 1,000 tons. Non-vacuum-sealed armour provides no protection but vacc suits and other vacuum-sealed armour provides full protection. If the compartment does not have its oxygen evacuated, the explosion is much more severe and the damage is increased to 3DD.

The Conflict phase ends when either the boarding party or ship's crew ceases attacking the other. For surviving members of a boarding party that has failed to accomplish its objectives, this might include a retreat to their own ship, which prolongs the phase until all fighting has ended. Even when the boarding party successfully achieves its objectives – taking the bridge, engineering, weapons and so on – things become more complicated when some members of the ship's crew refuse to surrender elsewhere in the ship. At this point, the boarding party must either search them out, persuade captured crew to get the holdouts to surrender or employ other means to neutralise them such as using life support systems to control oxygen flow where suspected holdouts might be in hiding or, at the extreme, pressurising an area and then opening apertures such as airlocks and cargo hold doors to eject them into space.

The possibilities and the potential for drama are endless. A member of the boarding party gets lost and is taken hostage by the crew. The bridge is taken and the crew are ordered to stand down but some of the crew want to fight to the bitter end. In the 'fog of war', the wrong objective, prisoner or other target is extracted by the boarding party and they realise it only after disconnecting the airlock umbilical and flying away. The Conflict phase is likely to be the most chaotic of a boarding action even when the odds are one-sided.

SECURE

The Secure phase occurs after all fighting has ceased and the ship has been secured by either the boarding party or its crew. A boarding party whose objective is complete takeover of a ship must secure all sections, round up crew, identify and remove any booby traps, and ensure that all of the ship's key components – or at least those not damaged during the boarding action – remain intact. While tasks like drive repair or getting key systems back online might still need to be done, the Secure phase is complete once one side has full control of the ship.

A boarding party with limited objectives completes the Secure phase after they have completed their objectives and successfully returned to their own ship.

Sometimes the boarding party is defeated by the crew of the ship. In this case, the Secure phase is complete when all members of the boarding party have either been killed, neutralised, captured or forced back into their own ship. The term 'secure' is relative for the crew whose ship was disabled during the Approach phase. A vindictive attacker whose boarding party has failed must decide what to do next. They might leave the crew of the ship – whose manoeuvre drive or power plant might be disabled – to their fates, pulverise the ship with weaponry after disengaging or negotiate to obtain their objectives whether that be the ship itself or some other goal.

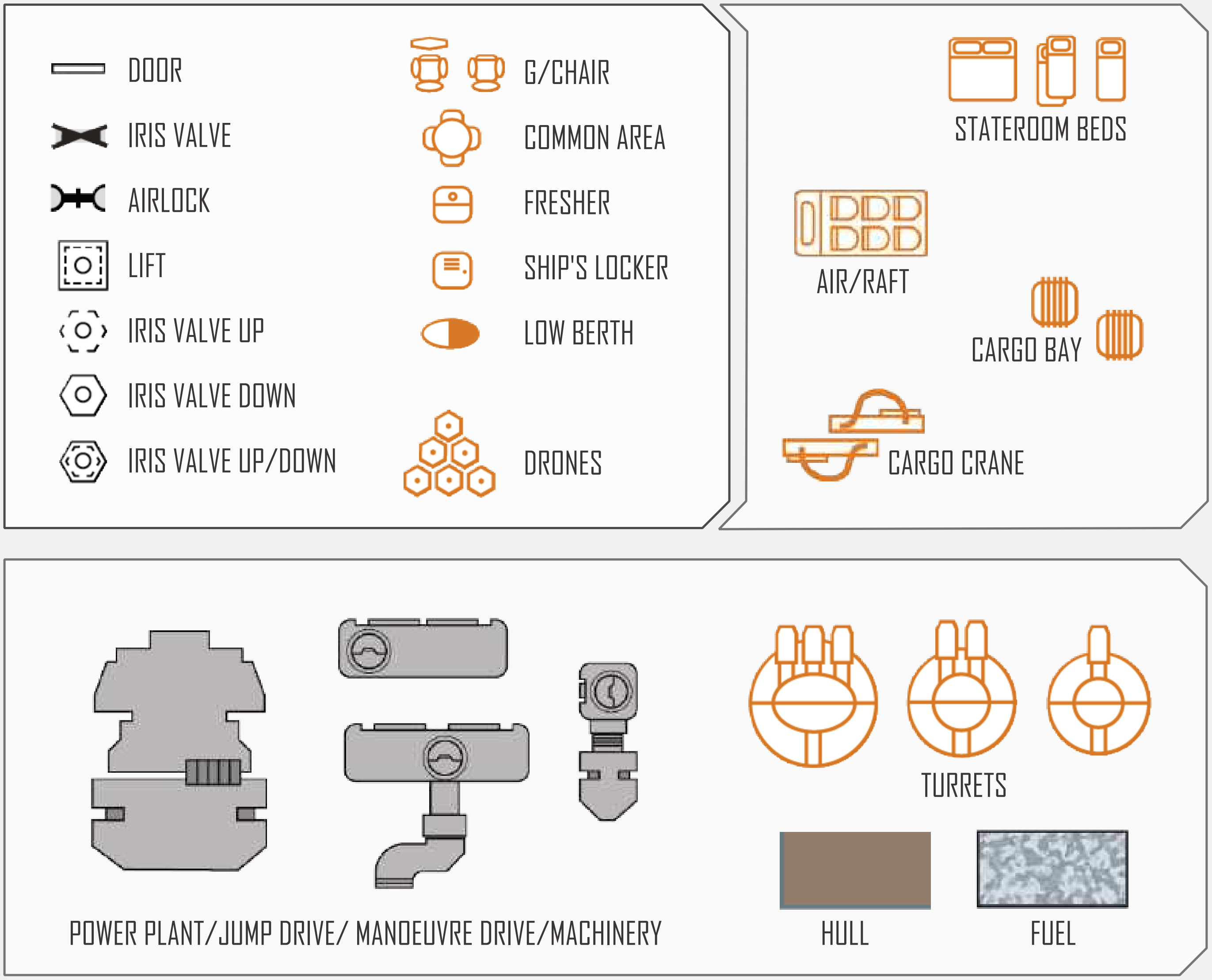
SPACECRAFT OF THE THIRD IMPERIUM

This chapter includes many of the most common ships found across the Third Imperium, both civilian and military. Where any of the details in these designs differ from those found in the *Traveller Core Rulebook*, the Referee is free to consider them alternate or variant designs in the wide expanse of the Third Imperium.

Most of the spacecraft described in this chapter are considered standard designs. Therefore, the Total for each ship includes the prices for all components, and the Purchase Cost includes the 10% discount if the ship qualifies. For ships that carry small craft, the Maintenance Cost includes the fees for each craft carried. Any deviation, customisation or other changes from the design shown invalidate the discount. After play begins, Travellers may add to the ship as normal without affecting the discount, as described in Customising Ships, page 70.

Deck plans are numbered starting with Deck 1 at the bottom of the ship and proceeding upward like floors in a multi-storey building.

DECKPLAN LEGEND:


DOOR
IRIS VALVE
AIRLOCK
LIFT
IRIS VALVE UP
IRIS VALVE DOWN
IRIS VALVE UP/DOWN
G/CHAIR
COMMON AREA
FRESHER
SHIP'S LOCKER
LOW BERTH
DRONES
STATEROOM BEDS
AIR/RAFT
CARGO BAY
CARGO CRANE
POWER PLANT/JUMP DRIVE/ MANOEUVRE DRIVE/MACHINERY
TURRETS
HULL
FUEL

ULTRALIGHT FIGHTER

This tiny fighter was built to be carried in flights of four, in the 30-ton Fighter Frame Module for the Modular Cutter (see page 144). It is designed to be employed against inferior adversaries – any serious resistance is likely to lead to a quick end for pilot and craft.

TL12		TONS	COST (MCr)
Hull	6 tons, Streamlined	—	0.36
	Stealth (Improved)	—	0.6
Armour	Crystaliron, Armour: 3	1.08	0.216
M-Drive	Thrust 6	0.36	0.72
Power Plant	Fusion (TL12), Power 15	1	1
Fuel Tanks	4 weeks of operation	1	—
Bridge	Cockpit	1.5	0.01
Computer	Computer/5	—	0.03
Sensors	Civilian Grade	1	3
Weapons	Fixed Mount (pulse laser)	—	1.1
Systems	Fuel Scoops	—	—
Software	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Cargo		0.06	—
Total: MCr7.036			

Crew

Pilot

Hull: 2

Running Costs

MAINTENANCE COST

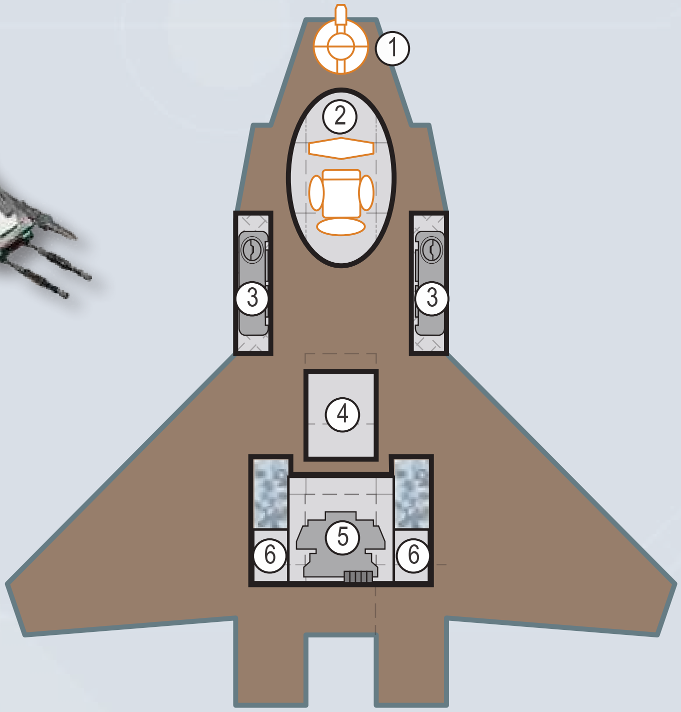
Cr528/month

PURCHASE COST

MCr6.3324

Power Requirements

Basic Ship Systems	2
Manoeuvre Drive	4
Sensors	1
Weapons	3



LEGEND

1. Fixed mount
2. Cockpit
3. Sensors
4. Cargo hold
5. Manoeuvre drive
6. Power plant

1 square = 0.5 Ton

LIGHT FIGHTER

Consisting of little more than a power plant and pulse laser with a pilot strapped to the top, the light fighter is a small, fast and highly manoeuvrable craft designed to make high-speed runs on enemy ships and destroy other small craft.

Designed to adhere to a strict budget, the light fighter allows even the poorest worlds a chance at self-defence.

TL12		TONS	COST (MCr)
Hull	10 tons, Streamlined	—	0.6
Armour	Crystaliron, Armour: 2	1.2	0.24
M-Drive	Thrust 6	0.6	1.2
Power Plant	Fusion (TL12), Power 15	1	1
Fuel Tanks	4 weeks of operation	1	—
Bridge	Cockpit	1.5	0.01
Computer	Computer/5	—	0.03
Sensors	Improved	3	4.3
Weapons	Fixed Mount (pulse laser)	—	1.1
Systems	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Fire Control/1	—	2
	Library	—	—
	Intellect	—	—
Cargo		1.7	—
Total: MCr10.48			

Crew

Pilot

Hull: 4

Running Costs

MAINTENANCE COST

Cr786/month

PURCHASE COST

MCr9.432

Power Requirements

Basic Ship Systems

2

Manoeuvre Drive

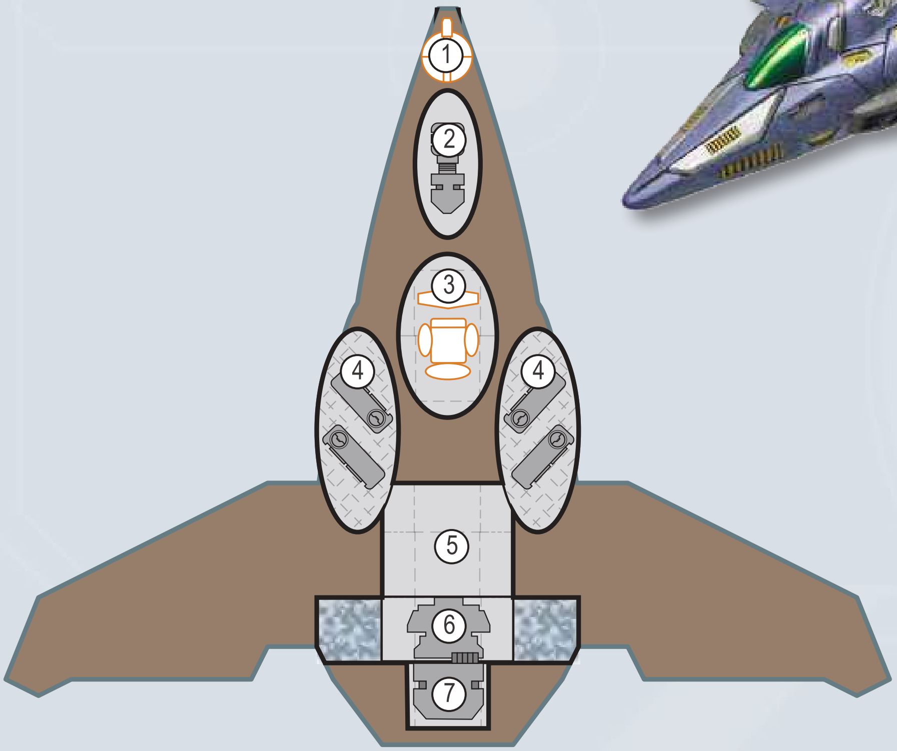
6

Sensors

4

Pulse Laser

3



LEGEND

1. Fixed mount
2. Avionics
3. Cockpit
4. Sensors
5. Cargo
6. Power plant
7. Manoeuvre drive

1 square = 0.5 Ton

MILITARY GIG

TYPE: Close Escort Variant

The close escort is partially streamlined and can skim gas giants for fuel. It cannot, however, land on worlds with atmospheres. To this end, the ship carries a 20-ton military gig in a docking clamp. Its high performance and armament give it the capability to chase down ships reluctant to allow boarding by naval authorities. The three emergency low berths allow the ship to carry prisoners or to serve as a lifeboat in emergencies. For its parent ship, see *Gazelle* Close Escort on page 181.

TL14		TONS	COST (MCr)
Hull	20 tons, Streamlined	—	1.2
	Stealth (Improved)	—	2
Armour	Bonded Superdense, Armour: 4	2.304	1.152
M-Drive	Thrust 8	1.6	3.2
Power Plant	Fusion (TL12), Power 30	2	2
Fuel Tanks	4 weeks of operation	1	—
Bridge	Holographic Controls	3	0.625
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (pulse laser, intense focus, high yield)	—	1.6
Systems	Fuel Scoops	—	—
	Acceleration Seats x6	3	0.18
	Emergency Low Berths x3	3	3
	Airlock	2	0.2
Software	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Cargo		2.096	—
Total: MCr15.187			

Crew

Pilot, Gunner

Hull: 8

Running Costs

MAINTENANCE COST

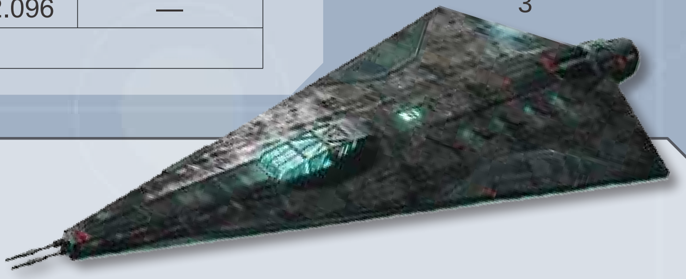
Cr1139/month

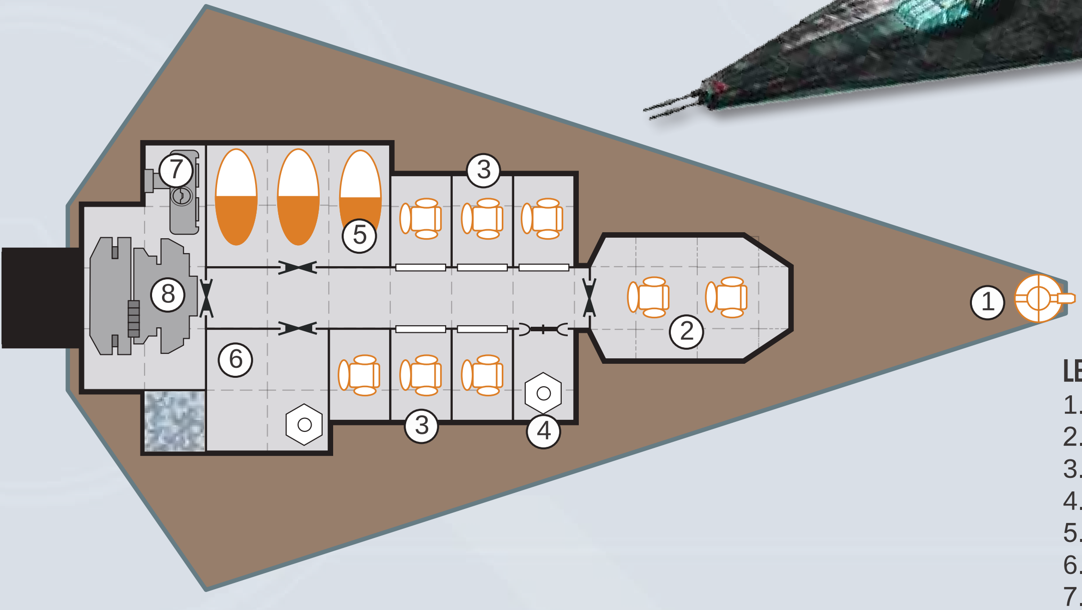
PURCHASE COST

MCr13.6683

Power Requirements

Basic Ship Systems	4
Manoeuvre Drive	16
Weapons	3
Emergency Low Berths	3





1 square = 0.5 Ton

LEGEND

1. Fixed mount
2. Bridge
3. Acceleration seats
4. Airlock
5. Low berths
6. Cargo hold
7. Power plant
8. Manoeuvre drive

LAUNCH

Also called a lifeboat, due to one of its expected roles, this craft uses a 20-ton hull and can easily be flown by a single skilled individual. A launch can be configured to engage in a wide variety of roles but ambitious users find themselves limited by the small hull, weak power plant and lack of an airlock. However, for the price, the launch provides a means to very cheap space travel.

TL12		TONS	COST (MCr)
Hull	20 tons, Streamlined	—	1.2
M-Drive	Thrust 1	0.2	0.4
Power Plant	Fusion (TL8), Power 10	1	0.5
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Systems	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		14.8	—
Total: MCr2.63			

Crew

Pilot

Hull: 8

Running Costs

MAINTENANCE COST

Cr197/month

PURCHASE COST

MCr2.367

Power Requirements

Basic Ship Systems

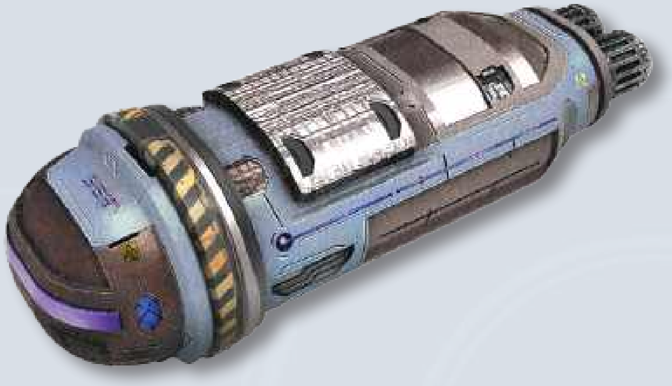
4

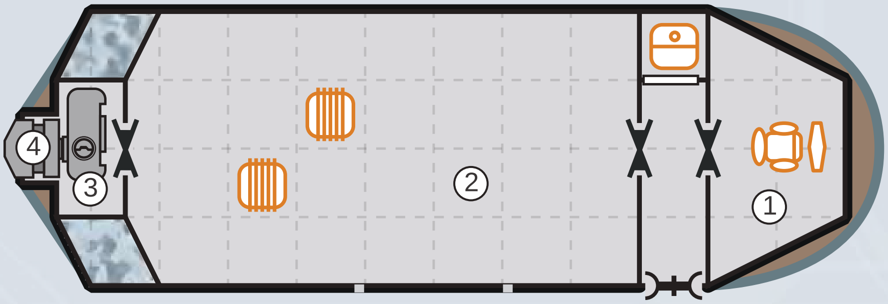
Manoeuvre Drive

2

LEGEND

1. Bridge
2. Cargo hold
3. Power plant
4. Manoeuvre drive





1 square = 0.5 Ton

SHIP'S BOAT

The ship's boat is both fast and versatile, making it a popular choice for auxiliary craft. While most commonly seen hauling small cargo and passenger loads between ships and worlds, in smaller militaries the ship's boat is also used as a boarding craft by marine assault teams.

TL12		TONS	Cost (MCr)
Hull	30 tons, Streamlined	—	1.8
M-Drive	Thrust 5	1.5	3
Power Plant	Fusion (TL12), Power 23	1.5	1.5
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Cabin Space x6	9	0.45
	Airlock	2	0.2
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		12	—
Total: MCr7.58			

Crew

Pilot

Hull: 12

Running Costs

MAINTENANCE COST

Cr569/month

PURCHASE COST

MCr6.822

Power Requirements

Basic Ship Systems

6

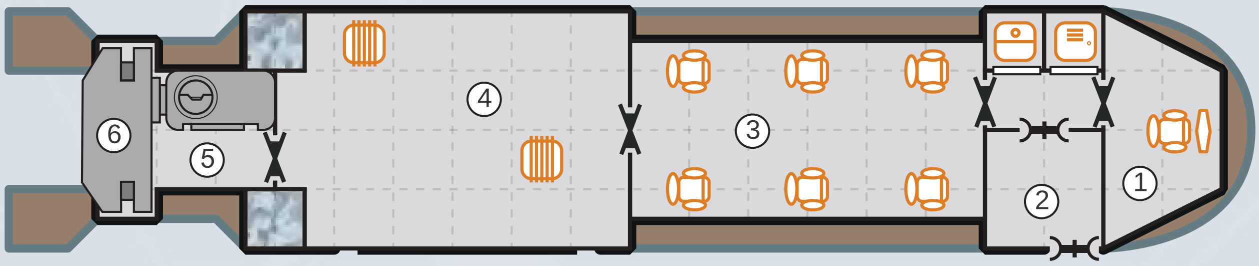
Manoeuvre Drive

15

1 square = 0.5 Ton

LEGEND

1. Bridge
2. Airlock
3. Cabin space
4. Cargo hold
5. Power plant
6. Manoeuvre drive



SLOW BOAT

The slow boat appears either as an early design of the ship's boat, before power plants and manoeuvre drives become more efficient, or as an intentional throttling back of the ship's boat performance. Either way, the slow boat is comparable to the ship's boat but trades speed for cargo space.

TL12		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	1.8
M-Drive	Thrust 3	0.9	1.8
Power Plant	Fusion (TL12), Power 15	1	1
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Cabin Space x2	3	0.15
	Airlock	2	0.2
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		19.1	—
Total: MCr5.58			

Crew

Pilot

Hull: 12

Running Costs

MAINTENANCE COST

Cr419/month

PURCHASE COST

MCr5.022

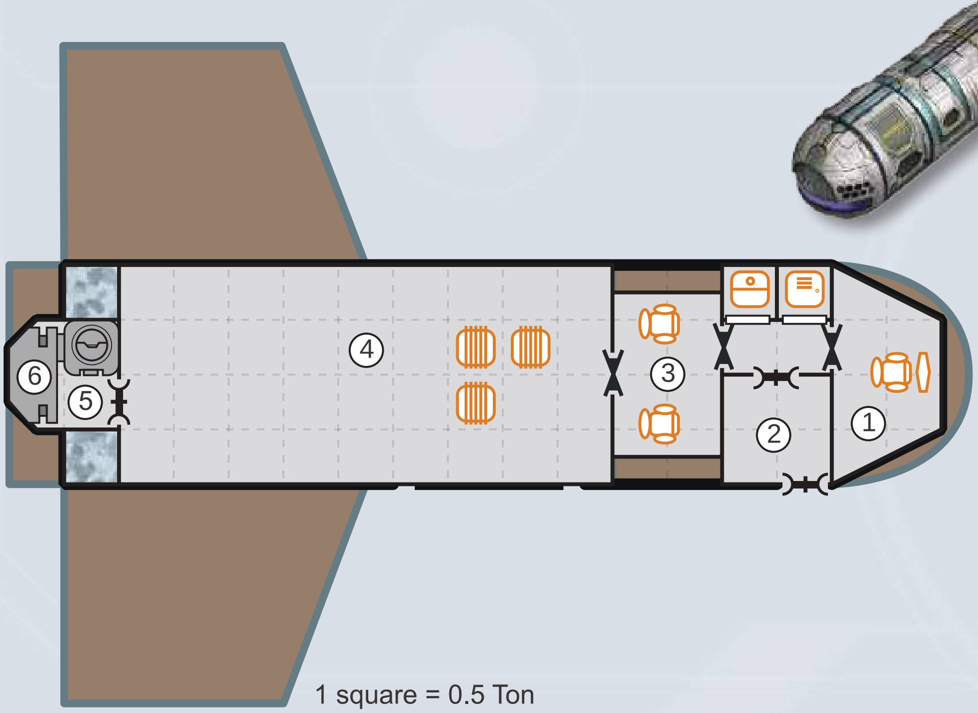
Power Requirements

Basic Ship Systems

6

Manoeuvre Drive

9



1 square = 0.5 Ton

LEGEND

1. Bridge
2. Airlock
3. Cabin space
4. Cargo hold
5. Power plant
6. Manoeuvre drive

PINNACE

The pinnace is a popular choice as an auxiliary vessel because it has the speed, range and cargo capacity to support extended missions.

TL12		Tons	Cost (MCr)
Hull	40 tons, Streamlined	—	2.4
M-Drive	Thrust 5	2	4
Power Plant	Fusion (TL12), Power 30	2	2
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Cabin Space x6	9	0.45
	Airlock	2	0.2
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		21	—
Total: MCr9.68			

Crew

Pilot

Hull: 16

Running Costs

MAINTENANCE COST

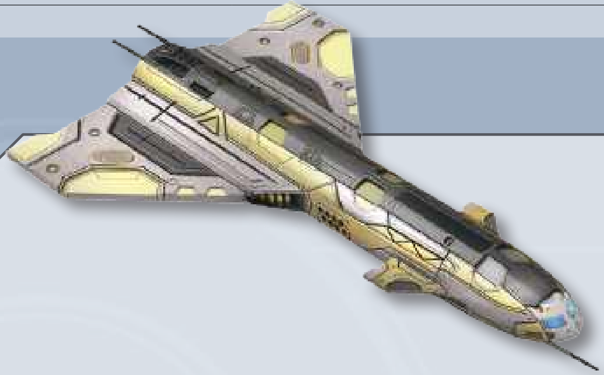
Cr726/month

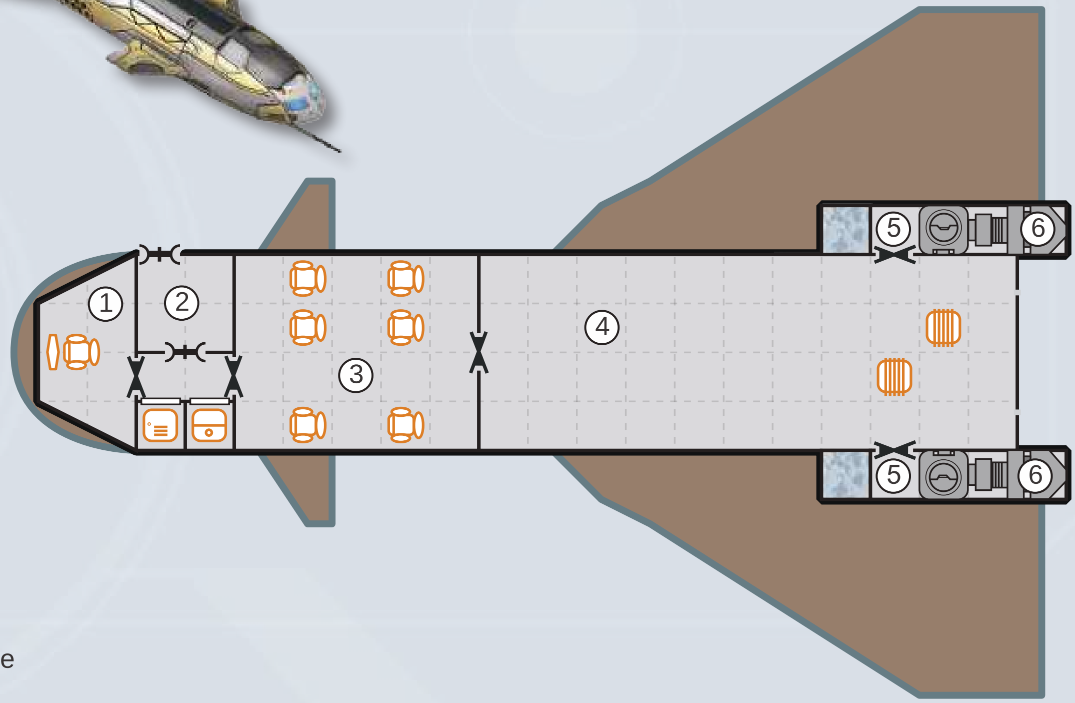
PURCHASE COST

MCr8.712

Power Requirements

Basic Ship Systems	8
Manoeuvre Drive	20





1 square = 0.5 Ton

LEGEND

1. Bridge
2. Airlock
3. Cabin space
4. Cargo hold
5. Power plant
6. Manoeuvre drive

SLOW PINNACE

Like the slow boat, the slow pinnace trades speed and raw performance for increased cargo space, although this craft is based on the traditional pinnace. As a larger hull, it provides even more cargo carrying capacity than a slow boat and many are customised to become troop or vehicle transports, or to serve as fuel skimmers for larger ships.

TL12		Tons	Cost (MCr)
Hull	40 tons, Streamlined	—	2.4
M-Drive	Thrust 3	1.2	2.4
Power Plant	Fusion (TL8), Power 20	2	1
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Airlock	2	0.2
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		30.8	—
Total: MCr6.63			

Crew

Pilot

Hull: 16

Running Costs

MAINTENANCE COST

Cr497/month

PURCHASE COST

MCr5.967

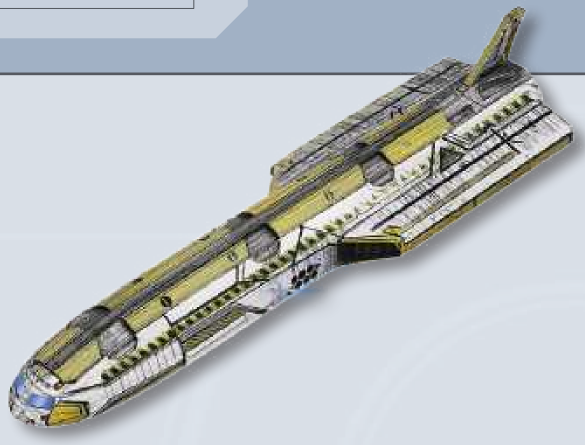
Power Requirements

Basic Ship Systems

8

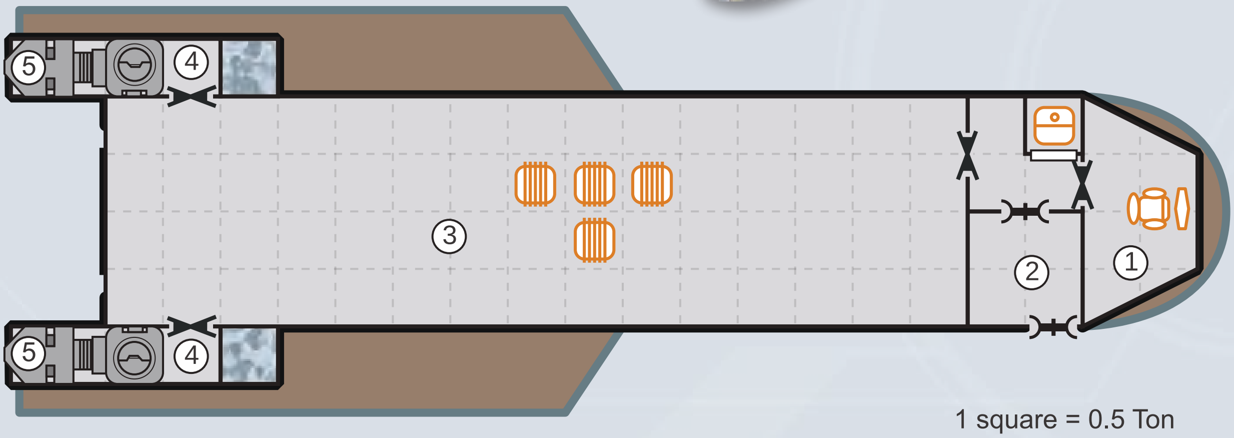
Manoeuvre Drive

9



LEGEND

1. Bridge
2. Airlock
3. Cargo hold
4. Power plant
5. Manoeuvre drive



1 square = 0.5 Ton

MODULAR CUTTER

The modular cutter is notable for having 30 tons dedicated to a detachable module, allowing the cutter to quickly and efficiently change roles during a voyage without needing extensive refits at a starport. With no module installed, the modular cutter is unstreamlined and capable of Thrust 6.

TL12		Tons	Cost (MCr)
Hull	50 tons, Streamlined	—	3
	Modular Hull (30 tons)	30	1.8
M-Drive	Thrust 4	2	4
Power Plant	Fusion (TL12), Power 30	2	2
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Fuel Scoops	—	—
	Airlock	2	0.2
	Cabin Space x4	6	0.3
Software	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Cargo		4	—
Total: MCr11.93			

Crew

Pilot

Hull: 20

Running Costs

MAINTENANCE COST

Cr895/month

PURCHASE COST

MCr10.737

Power Requirements

Basic Ship Systems

10

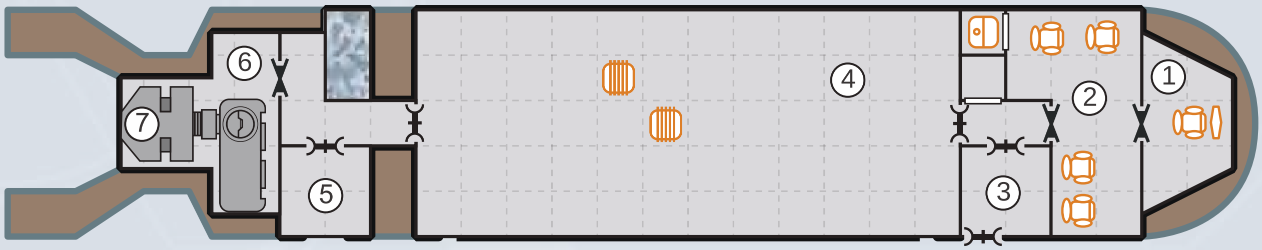
Manoeuvre Drive

20

1 square = 0.5 Ton

LEGEND

1. Bridge
2. Cabin space
3. Airlock
4. Module space
5. Cargo hold
6. Power plant
7. Manoeuvre drive



Vehicle Cradle Module

The Vehicle Cradle module fits one or more vehicles up to 15 tons total, along with acceleration seats for 12 personnel and seven tons of cargo. Vehicle not included.

TL7		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Systems	Docking Space (15 tons)	17	4.25
	Acceleration Seats x12	6	0.18
Cargo		7	—
Total: MCr5.33			

Maintenance Cost: Cr400/month
Purchase Cost: MCr4.797

Personnel Transport Module

The Personnel Transport module has acceleration seats for 60.

TL7		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Systems	Acceleration Seats x60	30	1.8
Total: MCr2.7			

Maintenance Cost: Cr203/month
Purchase Cost: MCr2.43

Cargo Transport Module

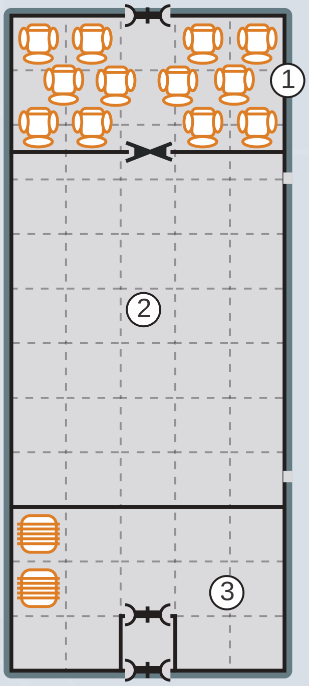
The Cargo Transport module has acceleration seats for 10, and a 25-ton cargo bay.

Maintenance Cost: Cr90/month
Purchase Cost: MCr1.08

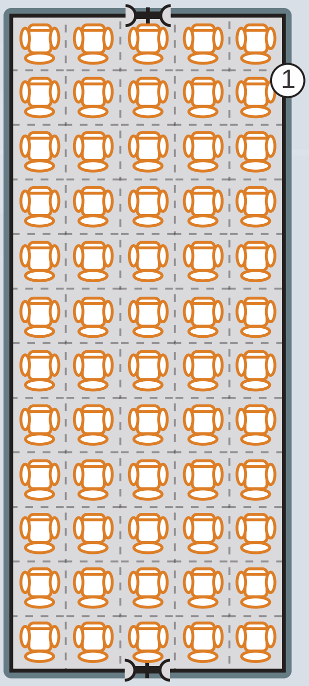
TL7		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Systems	Acceleration Seats x10	5	0.3
Cargo		25	—
Total: MCr1.2			

LEGEND
1. Acceleration seats
2. Docking space
3. Cargo hold

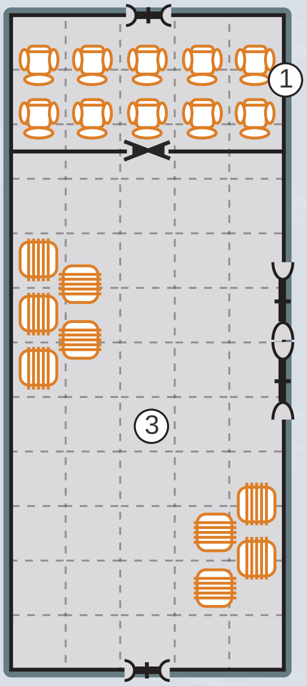
1 square = 0.5 Ton



Vehicle Cradle Module



Personnel Transport Module



Cargo Transport Module

Fuel Skimmer Module

The Fuel Skimmer has fuel scoops, 28 tons of fuel tankage and two tons of UNREP System.

TL7		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Fuel		28	—
Systems	Fuel Scoops	—	—
	UNREP System	2	1
Total: MCr1.9			

Maintenance Cost: Cr143/month
Purchase Cost: MCr1.71

TL7		Tons	Cost (MCr)
Hull	30 tons, Dispersed Structure	—	0.375
Systems	Docking Clamp (Type I) x4	4	27.744
Craft	Ultralight Fighters x4	24	24.9696
Cargo		2	—
Total: MCr30.119			

Maintenance Cost: Cr2259/month
Purchase Cost: MCr27.1071

Assault Boat Module

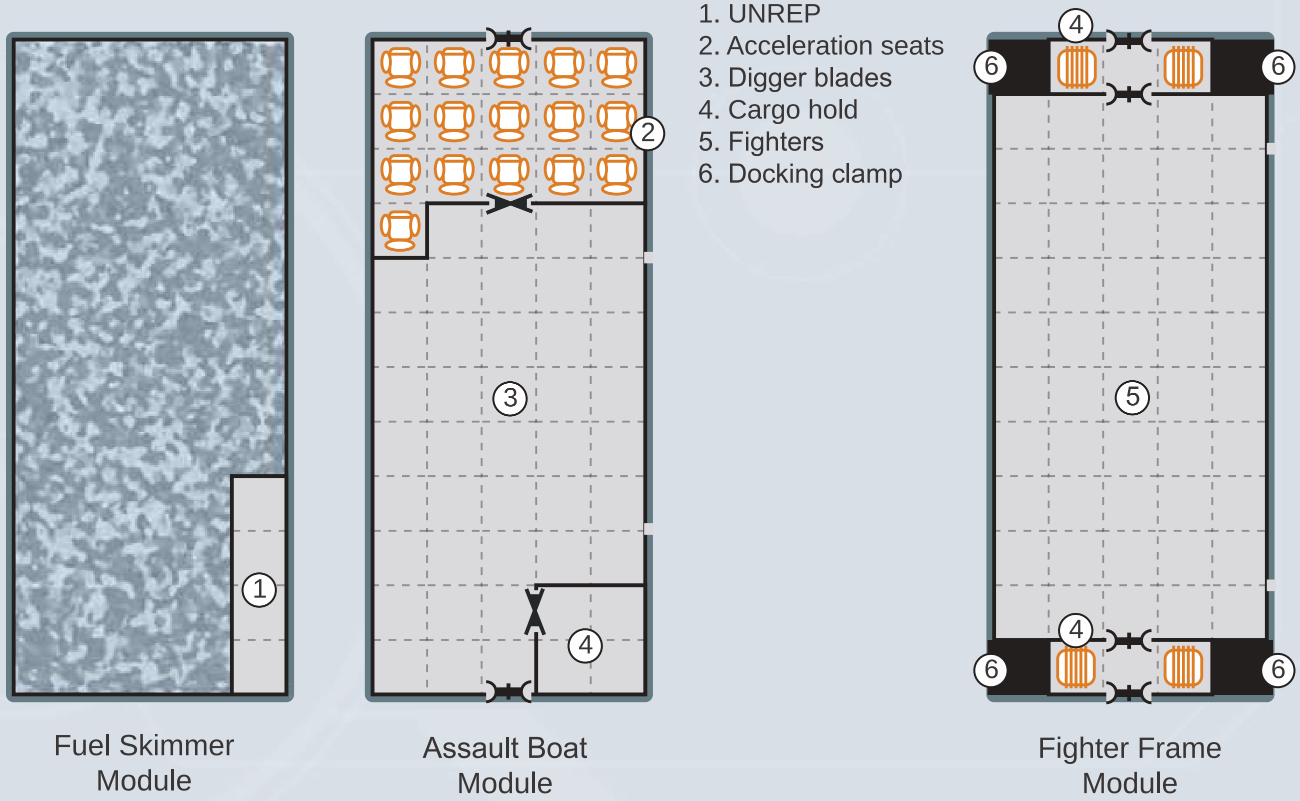
The Assault Boat module includes acceleration seats for 16 troops in two sections, each with a bottom mounted door. Upon landing, eight digger blades (see the *Vehicle Handbook*) scoop out emergency entrenchments; the troops jump down into hastily created foxholes and the cutter with the module immediately moves out of the battle area.

TL12		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Systems	Acceleration Seats x16	8	0.48
	Digger Blades x8	20	0.2
Cargo		2	—
Total: MCr1.58			

Maintenance Cost: Cr119/month
Purchase Cost: MCr1.422

Fighter Frame Module

The Fighter Frame is an open frame mounting four six-ton Ultralight Fighters (see page 136) in docking clamps, along with two tons of cargo space. The cutter is not streamlined when equipped with this module.



Fuel Skimmer Module

Assault Boat Module

Fighter Frame Module

LEGEND
1. UNREP
2. Acceleration seats
3. Digger blades
4. Cargo hold
5. Fighters
6. Docking clamp

1 square = 0.5 Ton

Pressurised Shelter Module

Pressurised Shelter module provides an independent living quarters module for eight persons in four staterooms, complete with four tons of common areas, TL8 fusion power plant providing Power 10 for four weeks of operation, Computer/5, airlock and six tons of cargo space.

TL8		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Power Plant	Fusion (TL 8), Power 10	1	0.5
Fuel	4 weeks operation	1	—
Computer	Computer/5	—	0.03
Software	Library Intellect	— —	— —
Systems	Airlock	2	—
Accommodations	Standard x4	16	2
Common Areas		4	0.4
Cargo		6	—
Total: MCr3.83			

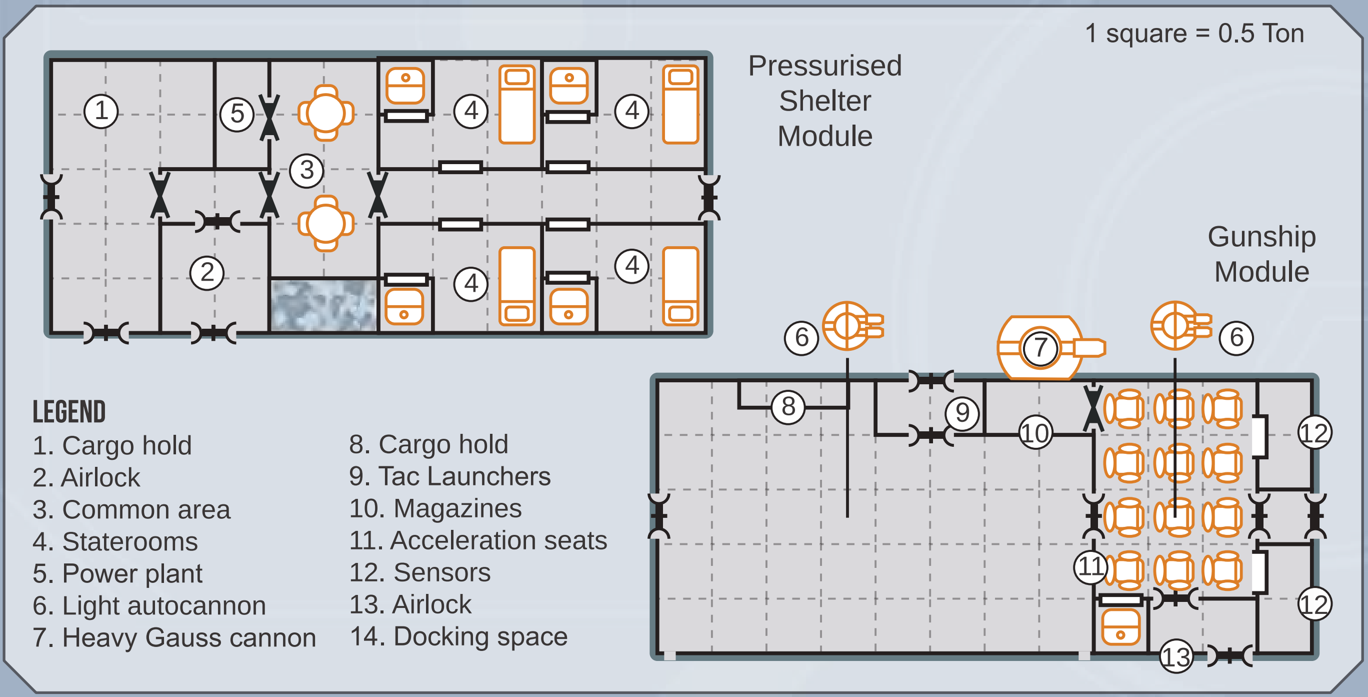
Maintenance Cost:	Cr288/month
Purchase Cost:	MCr3.447

Gunship Module

The Gunship module is a military version of the Vehicle Cradle module, designed to land troops and then provide fire support for them, retaining the passenger and vehicle carrying capacity but sacrificing all cargo space in exchange for Civilian Sensors, two sensor stations for gunners, a heavy gauss cannon in a fixed mount with four additional magazines (generally equipped with a variety of different ammunition types), two linked light autocannons and two anti-aircraft TAC launchers (refer to the *Central Supply Catalogue* and the *Vehicle Handbook* for details on these weapons). Vehicle and ammunition not included.

TL12		Tons	Cost (MCr)
Hull	30 tons, Streamlined	—	0.9
Sensors	Military Grade	2	4.1
Weapons	Fixed Mount (heavy gauss cannon) Pop-up (light autocannon x2, linked) Pop-ups (TAC launcher, anti-aircraft) x2	2 0.5 0.5	0.325 0.122 0.132
Ammunition	Heavy Gauss Cannon Magazines x4 (300 shots)	1	—
Systems	Docking Space (15 tons) Acceleration Seats x12	17 6	4.25 0.18
Cargo		1	—
Total: MCr10.009			

Maintenance Cost:	Cr751/month
Purchase Cost:	MCr9.0081



LEGEND

1. Cargo hold
2. Airlock
3. Common area
4. Staterooms
5. Power plant
6. Light autocannon
7. Heavy Gauss cannon
8. Cargo hold
9. Tac Launchers
10. Magazines
11. Acceleration seats
12. Sensors
13. Airlock
14. Docking space

HEAVY FIGHTER

The heavy fighter is an attempt to provide a powerful, fast, agile, armoured and dependable small craft for space superiority. It has bunking arrangements for crew comfort, which allow the craft to remain on duty for days, although the lack of common areas limits crew endurance and typically dictates patrols of no more than a week. Only a single gunner position is listed as the missiles are intended as standoff or bombardment ordnance, to be fired by the pilot when not in a dogfight or otherwise occupied.

TL15		Tons	Cost (MCr)
Hull	50 tons, Streamlined	—	3
	Reinforced	—	1.5
Armour	Bonded Superdense, Armour: 15	14.4	7.2
M-Drive	Thrust 9	4.5	9
Power Plant	Fusion (TL15), Power 70	3.5	7
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/35	—	30
Sensors	Advanced	5	5.3
Weapons	Single Turret (beam laser)	1	0.7
	Fixed Mount (missile rack)	—	0.85
Ammunition	Missile Storage (60 missiles)	5	—
Armoured Bulkheads	Bridge	0.3	0.06
	Manoeuvre Drive	0.45	0.09
	Power Plant	0.35	0.07
	Sensors	0.5	0.1
Systems	Airlock	2	0.2
	Fuel Scoops	—	—
Staterooms	Standard x2	8	1
Software	Manoeuvre	—	—
	Evade/2	—	2
	Fire Control/4	—	8
	Library	—	—
	Intellect	—	—
Cargo		0.95	—
Total: MCr76.57			

Crew

Pilot, Gunner

Hull: 22

Running Costs

MAINTENANCE COST

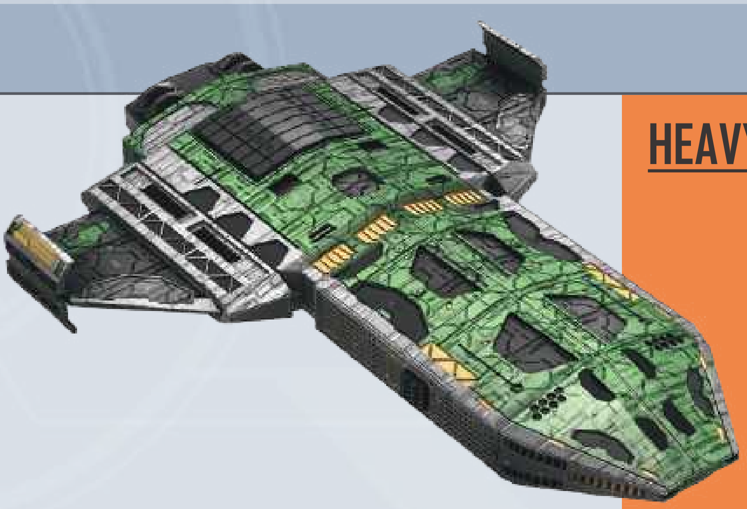
Cr5743/month

PURCHASE COST

MCr68.913

Power Requirements

Basic Ship Systems	10
Manoeuvre Drive	45
Sensors	6
Weapons	4

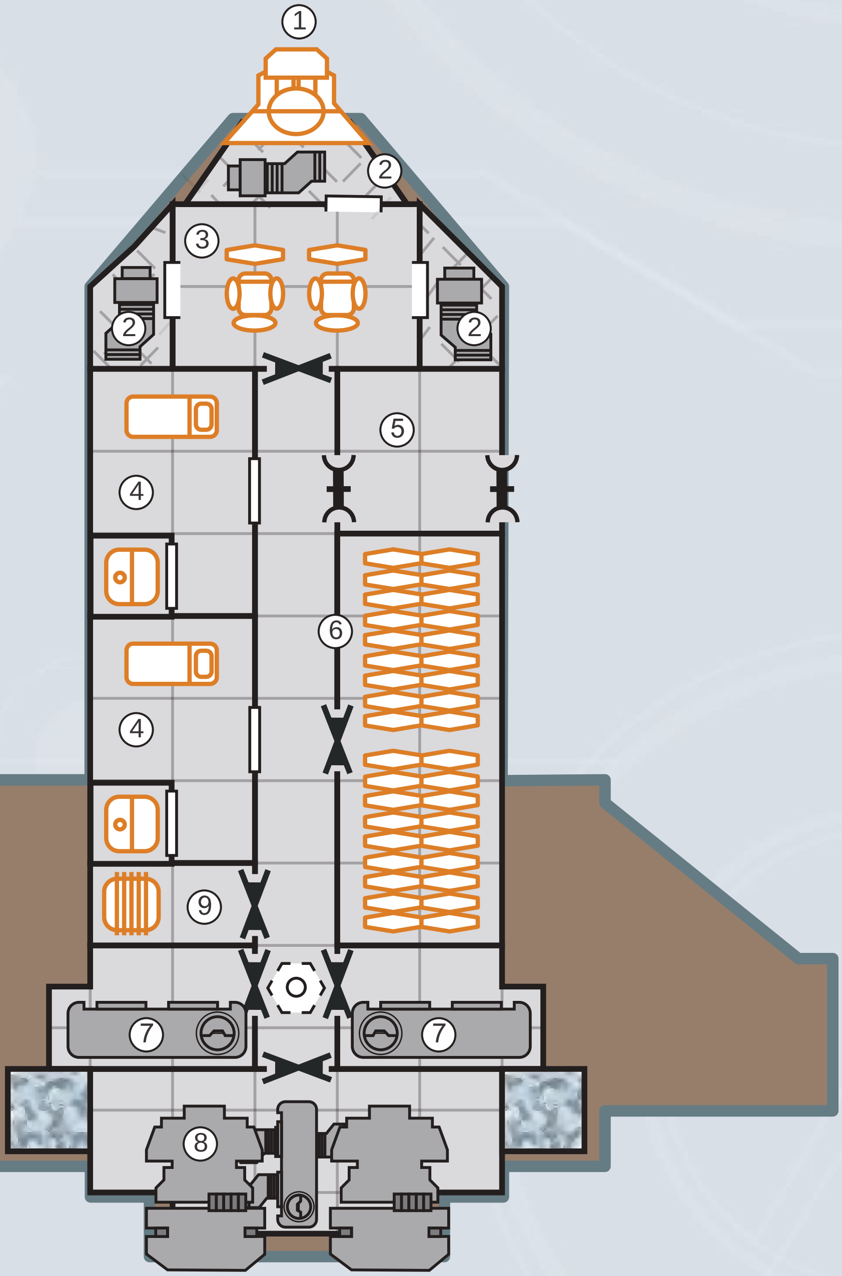


HEAVY FIGHTER

1 square = 0.5 Ton

LEGEND

1. Missile rack
2. Sensors
3. Bridge
4. Stateroom
5. Airlock
6. Missile storage
7. Power plant
8. Manoeuvre drive
9. Cargo hold
10. Single turret



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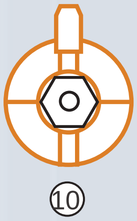


TROOP TRANSPORT

The 50-ton troop transport was designed and produced by the Imperial Navy to meet a long-established need for deployment of troops from orbit to world surface. The 50-ton limit on displacement allows the craft to be deployed on ships possessing standard 50-ton launch tubes. Acceleration seats are used, instead of more space-efficient acceleration benches, to accommodate troops in battle dress. Since all crew and passengers are expected to be in sealed armour, this craft has no airlocks, which also speeds up boarding and deployment. Only a single gunner position is listed, as it is standard practice to let one of the carried troops operate the missile launcher.

TL15		Tons	Cost (MCr)
Hull	50 tons, Streamlined	—	3
	Reinforced	—	1.5
	Stealth (Improved)	—	5
Armour	Bonded Superdense, Armour: 5	4.8	2.4
M-Drive	Thrust 9	4.5	9
Power Plant	Fusion (TL15), Power 60	3	6
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/25	—	10
Sensors	Improved	3	4.3
Weapons	Single Turret (sandcaster)	1	0.45
	Fixed Mount (missile rack)	—	0.85
Ammunition	Sandcaster Canister Storage (30 Canisters)	1.5	0
	Missile Storage (18 Missiles)	1.5	0
Systems	Acceleration Seats x50	25	1.5
Software	Manoeuvre	—	—
	Evade/2	—	2
	Fire Control/2	—	4
	Library	—	—
	Intellect	—	—
Cargo		1.7	—
Total: MCr50.5			

Crew

Pilot, Gunner

Hull: 22

Running Costs

MAINTENANCE COST

Cr3788/month

PURCHASE COST

MCr45.45

Power Requirements

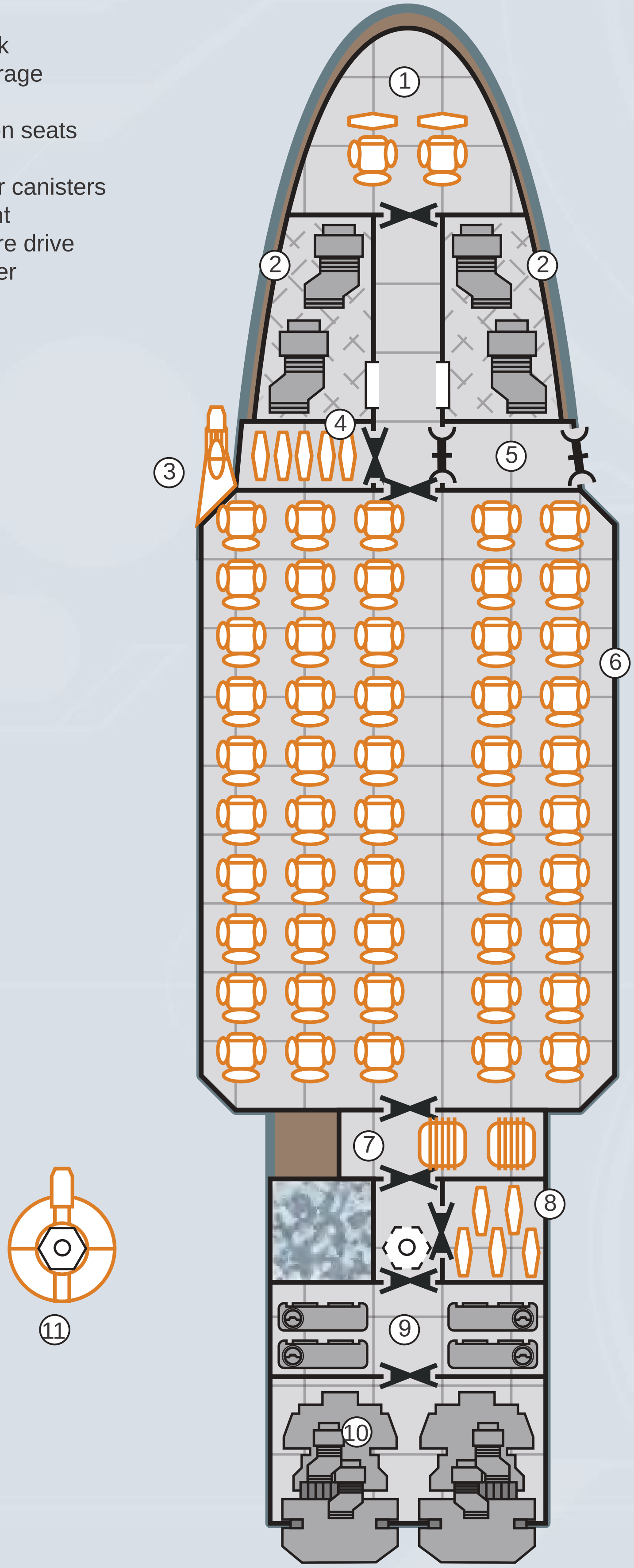
Basic Ship Systems	10
Manoeuvre Drive	45
Sensors	4
Weapons	1

TROOP TRANSPORT

LEGEND

1. Bridge
2. Sensors
3. Missile rack
4. Missile storage
5. Airlock
6. Acceleration seats
7. Cargo hold
8. Sandcaster canisters
9. Power plant
10. Manoeuvre drive
11. Sandcaster

1 square = 0.5 Ton



TORPEDO BOAT

The torpedo boat provides a small and evasive delivery package for lethal torpedo weapons. Properly used and defended, torpedo boat squadrons are a danger to much larger ships. With its small size and manoeuvrability, it is extremely difficult to hit and even if several are destroyed en route to their target, all it takes is a portion of them to get close enough to do immense damage.

The torpedo boat presented here was deliberately designed at TL12 so that it can be built and supported at more shipyards within the Imperium. More advanced versions of up to TL15 are also manufactured. Any tonnage gained is usually used to improve its sensors or store more torpedoes.

TL12		Tons	Cost (MCr)
Hull	70 tons, Streamlined	—	4.2
	Reinforced	—	2.1
Armour	Crystaliron, Armour: 12	25.2	5.04
M-Drive	Thrust 6	4.2	8.4
Power Plant	Fusion (TL12), Power 66	4.4	4.4
Fuel Tanks	4 weeks of operation	1	—
Bridge		3	0.5
Computer	Computer/20	—	5
Sensors	Improved	3	4.3
Weapons	Torpedo Barbette	7	3
Ammunition	Torpedo Storage (30 torpedoes)	10	—
Armoured Bulkheads	Armoured Bulkheads (bridge)	0.6	0.12
	Armoured Bulkheads (manoeuvre drive)	0.42	0.084
	Armoured Bulkheads (power plant)	0.43	0.086
	Armoured Bulkheads (sensors)	0.3	0.06
Systems	Airlock	2	0.2
	Fuel Scoops	—	—
Staterooms	Standard	4	0.5
Software	Manoeuvre	—	—
	Evade/2	—	2
	Fire Control/1	—	2
	Library	—	—
	Intellect	—	—
Cargo		1.62	—
Total: MCr46.008			

Crew

Pilot, Gunner

Hull: 30

Running Costs

MAINTENANCE COST

Cr3451/month

PURCHASE COST

MCr41.4072

Power Requirements

Basic Ship Systems

14

Manoeuvre Drive

42

Sensors

4

Weapons

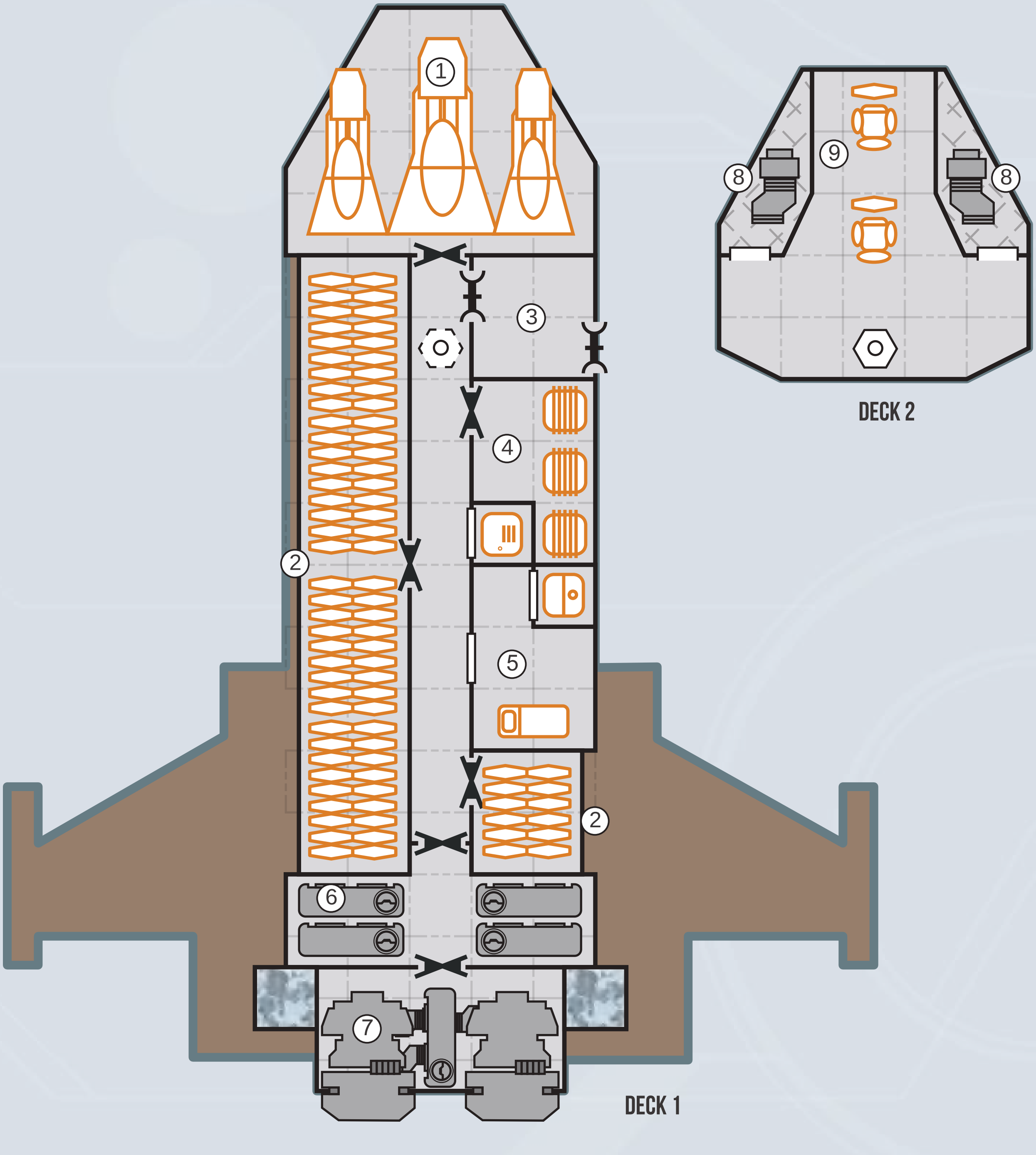
2

TORPEDO BOAT

LEGEND

1. Torpedo barbette
2. Torpedo storage
3. Airlock
4. Cargo hold
5. Stateroom
6. Power plant
7. Manoeuvre drive
8. Sensors
9. Bridge

1 square = 0.5 Ton



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DECK 2

SHUTTLE

One of the most common craft seen in space, the shuttle is present throughout the galaxy and becomes a standard vessel for orbital operations as soon as a civilisation makes its first firm steps into space. It is designed to carry passengers and cargo from orbit to surface and back again, as well as act as an interplanetary transport.

TL10		Tons	Cost (MCr)
Hull	95 tons, Streamlined	—	5.7
	Aerofins	4.75	0.475
M-Drive	Thrust 3	2.85	5.7
Power Plant	Fusion (TL12), Power 48	3	3
Fuel Tanks	4 weeks of operation	1	—
Bridge		6	0.5
Computer	Computer/5	—	0.03
Sensors	Basic	—	—
Weapons	Fixed Mount (empty)	—	0.1
Systems	Cabin Space x8	12	0.6
	Airlock	2	0.2
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Cargo		63.4	—
Total: MCr16.305			

Crew

Pilot

Hull: 38

Running Costs

MAINTENANCE COST

Cr1223/month

PURCHASE COST

MCr14.6745

Power Requirements

Basic Ship Systems

19

Manoeuvre Drive

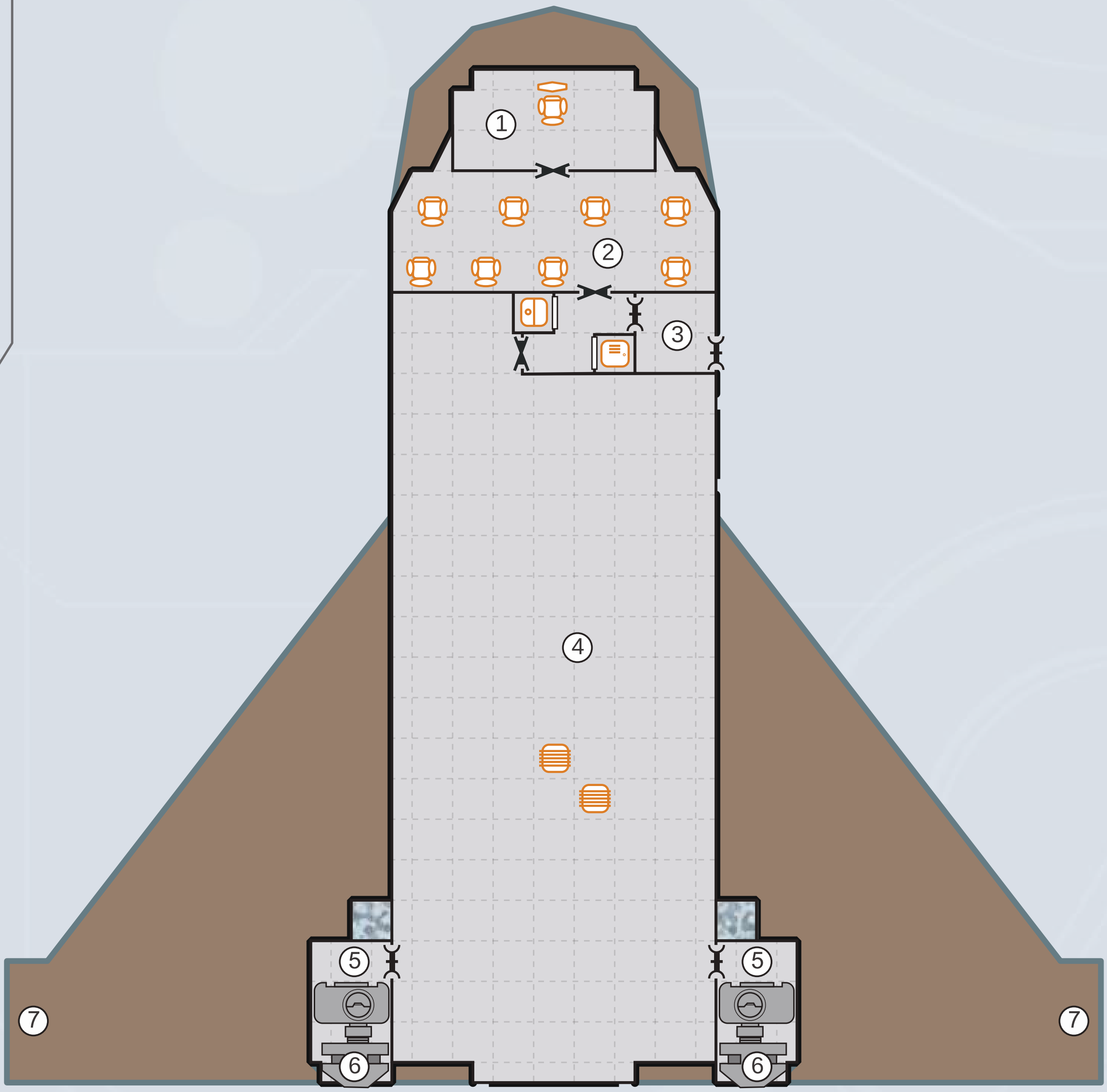
29

SHUTTLE

LEGEND

1. Bridge
2. Cabin space
3. Airlock
4. Cargo hold
5. Power plant
6. Manoeuvre drive
7. Aerofins

1 square = 0.5 Ton



PASSENGER SHUTTLE

Intended for routine passenger transport for trips taking no more than a few hours, this shuttle fills the need at a reasonable price point and is capable of carrying up to 240 passengers. Cargo is intended for emergency supplies and luggage: 0.05 tons per passenger.

The shuttle has a small cargo bay, passenger area and crew section separated by internal bulkheads. Normally only the passenger area is accessible to non-crew. Operations are sufficiently routine and short that no stewards are carried, nor do the crew interact with the passengers except to pass on announcements when necessary. The ship can be flown by just a single pilot. For safety during routine operations, a co-pilot is required.

TL9		Tons	Cost (MCr)
Hull	95 tons, Streamlined	—	5.7
M-Drive	Thrust 1	0.95	1.9
Power Plant	Fusion (TL8), Power 30	3	1.5
Fuel Tanks	4 weeks of operation	1	—
Bridge		6	0.5
Computer	Computer/5	—	0.03
Sensors	Civilian Grade	1	3
Systems	Acceleration Benches x60	60	0.6
	Airlock	2	0.2
	Aerofins	4.75	0.475
	Fuel Scoops	—	—
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
Common Areas		4	0.4
Cargo		12.3	—
Total: MCr14.305			

Crew

Pilot, Co-Pilot

Hull: 38

Running Costs

MAINTENANCE COST

Cr1073/month

PURCHASE COST

MCr12.8745

Power Requirements

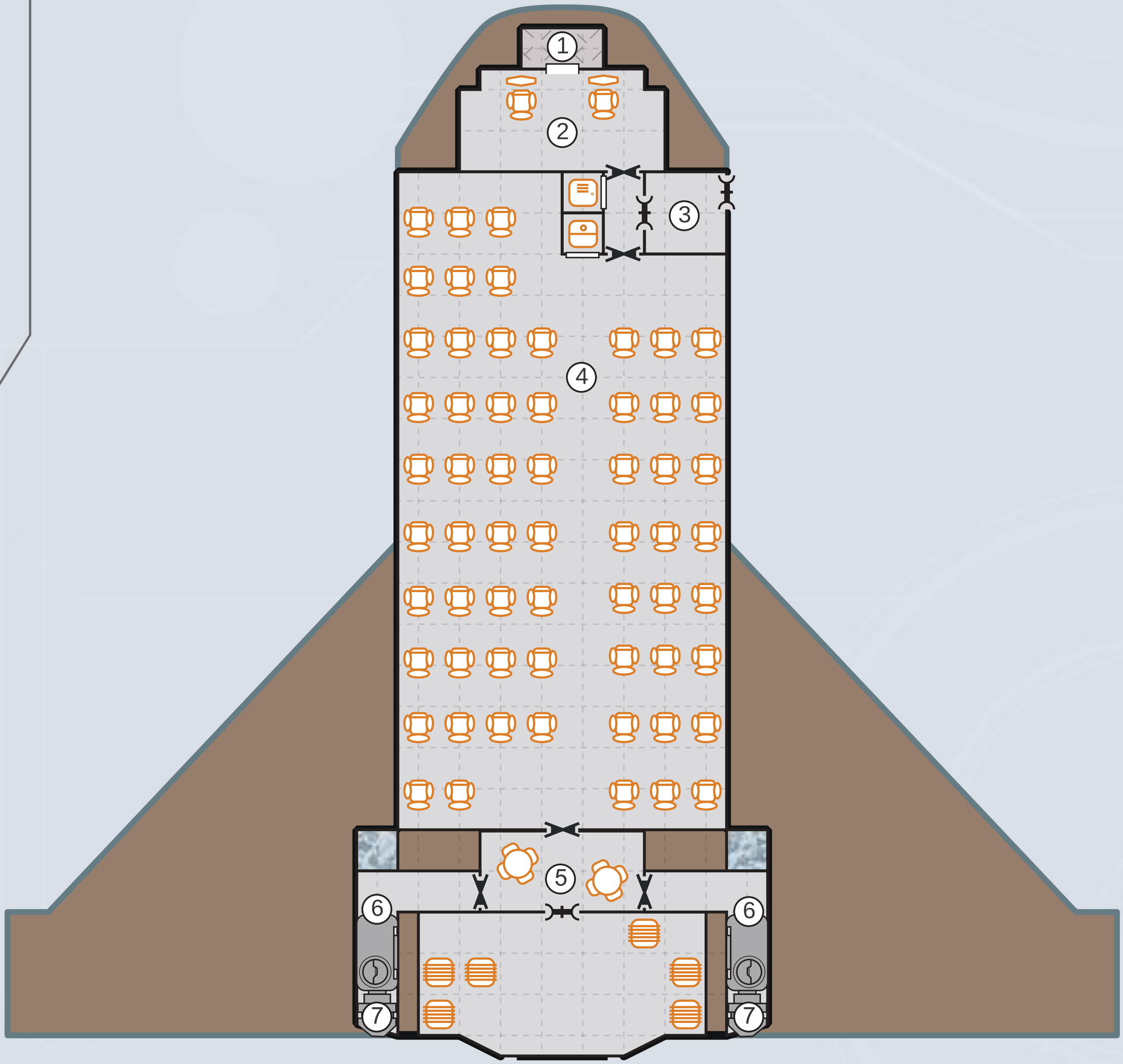
Basic Ship Systems	19
Manoeuvre Drive	10
Sensors	1

PASSENGER SHUTTLE

1 square = 0.5 Ton

LEGEND

1. Sensors
2. Bridge
3. Airlock
4. Acceleration seats
5. Common area
6. Power plant
7. Manoeuvre drive



EXPRESS BOAT

The express boat (x-boat) is the key to the Imperial communication network. The Scout Service maintains an extensive array of designated routes and supporting tenders to allow access to nearly every important system in the empire. The 100-ton x-boat is the fast courier that carries data and messages between those points.

The jump drive is powered by the battery, which is recharged during refuelling operations by an express boat tender, described on page 204.

TL13		Tons	Cost (MCr)
Hull	100 tons, Sphere	—	5.5
J-Drive	Jump 4 (increased size)	18.75	16.875
Power Plant	Fusion (TL8), Power 20	2	1
High-Efficiency Battery	TL10, 40 Power	1	0.1
Fuel Tanks	J-4, 4 weeks of operation	41	—
Bridge		10	0.5
Computer	Computer/15bis	—	3
Sensors	Basic	—	—
Systems	Mail Distribution Array (TL13)	20	10
	Re-entry Capsule	0.5	0.02
Staterooms	Standard	4	0.5
Software	Jump Control/4	—	0.4
	Library	—	—
	Intellect	—	—
Cargo		2.75	—
Total: MCr37.895			

Crew

Astrogator/Engineer

Hull: 40

Running Costs

MAINTENANCE COST

Cr2842/month

PURCHASE COST

MCr34.1055

Power Requirements

Basic Ship Systems

20

Jump Drive

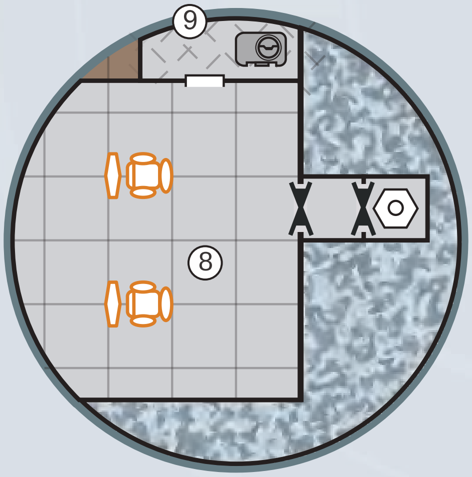
40

EXPRESS BOAT

LEGEND

1. Jump drive
2. Power plant
3. Mail distribution array
4. Cargo hold
5. High efficiency battery
6. Stateroom
7. Airlock
8. Bridge
9. Sensors

1 square = 0.5 Ton



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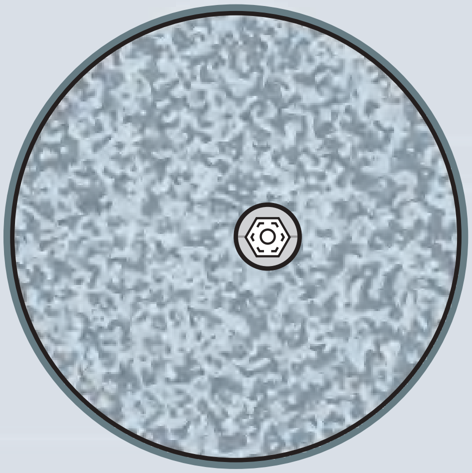
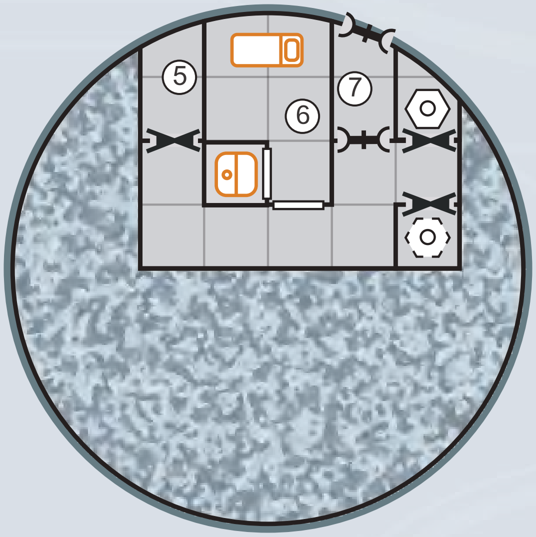


DECK 3



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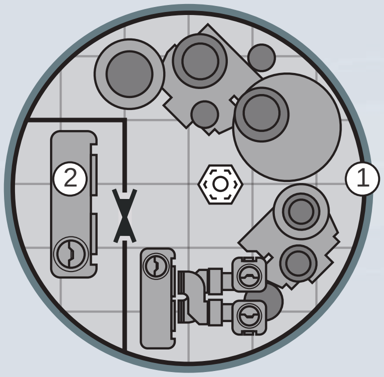

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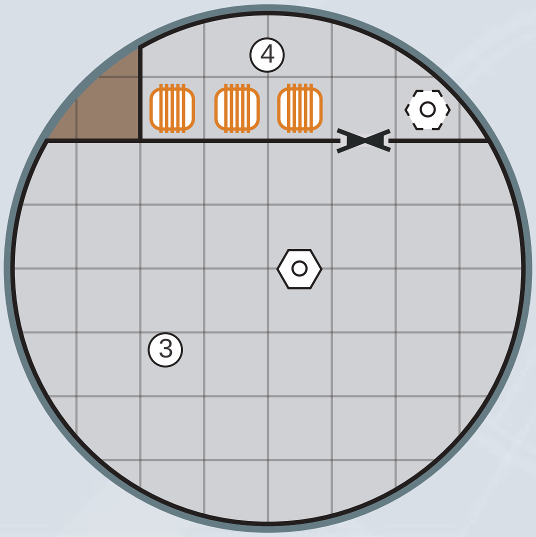

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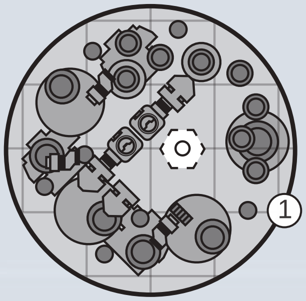


DECK 1

SCOUT/COURIER

TYPE: S (SULIEMAN CLASS)

The scout ship is built for exploration, survey and courier duties, with many thousands in service throughout Charted Space. It is an exemplar of a mass-produced ship in the Third Imperium. Despite the small 100-ton hull, the Type-S has proven itself a versatile design, capable of handling a wide range of missions. Common minor modifications include enhancing the filtration systems by adding biospheres, placing beam lasers in the turret and installing laundry and a galley (four tons of common areas) in the cargo hold. Many substantial revisions have become their own ship classes, such as the Type-J seeker. While two crew positions are listed, it is often crewed by a single pilot/astrogator, as the only person aboard, or carrying other Travellers with no ship skills. When extra Travellers need crew positions to give them something to do, they are typically assigned as gunner (if the turret has weapons), engineer, sensor operator, medic, steward or marine, in that order of priority.

TL12		Tons	Cost (MCr)
Hull	100 tons, Streamlined	—	6
Armour	Crystaliron, Armour: 4	6	1.2
M-Drive	Thrust 2	2	4
J-Drive	Jump 2	10	15
Power Plant	Fusion (TL12), Power 60	4	4
Fuel Tanks	J-2, 12 weeks of operation	23	—
Bridge		10	0.5
Computer	Computer/5bis	—	0.045
Sensors	Military Grade	2	4.1
Weapons	Double Turret (empty)	1	0.5
Craft	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Fuel Processor (40 tons/day)	2	0.1
	Fuel Scoops	—	—
	Probe Drones x10	2	1
	Workshop	6	0.9
Staterooms	Standard x4	16	2
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Cargo		11	—
Total: MCr41.045			

Crew

Pilot, Astrogator, Engineer

Hull: 40

Running Costs

MAINTENANCE COST

Cr3079/month

PURCHASE COST

MCr36.9405

Power Requirements

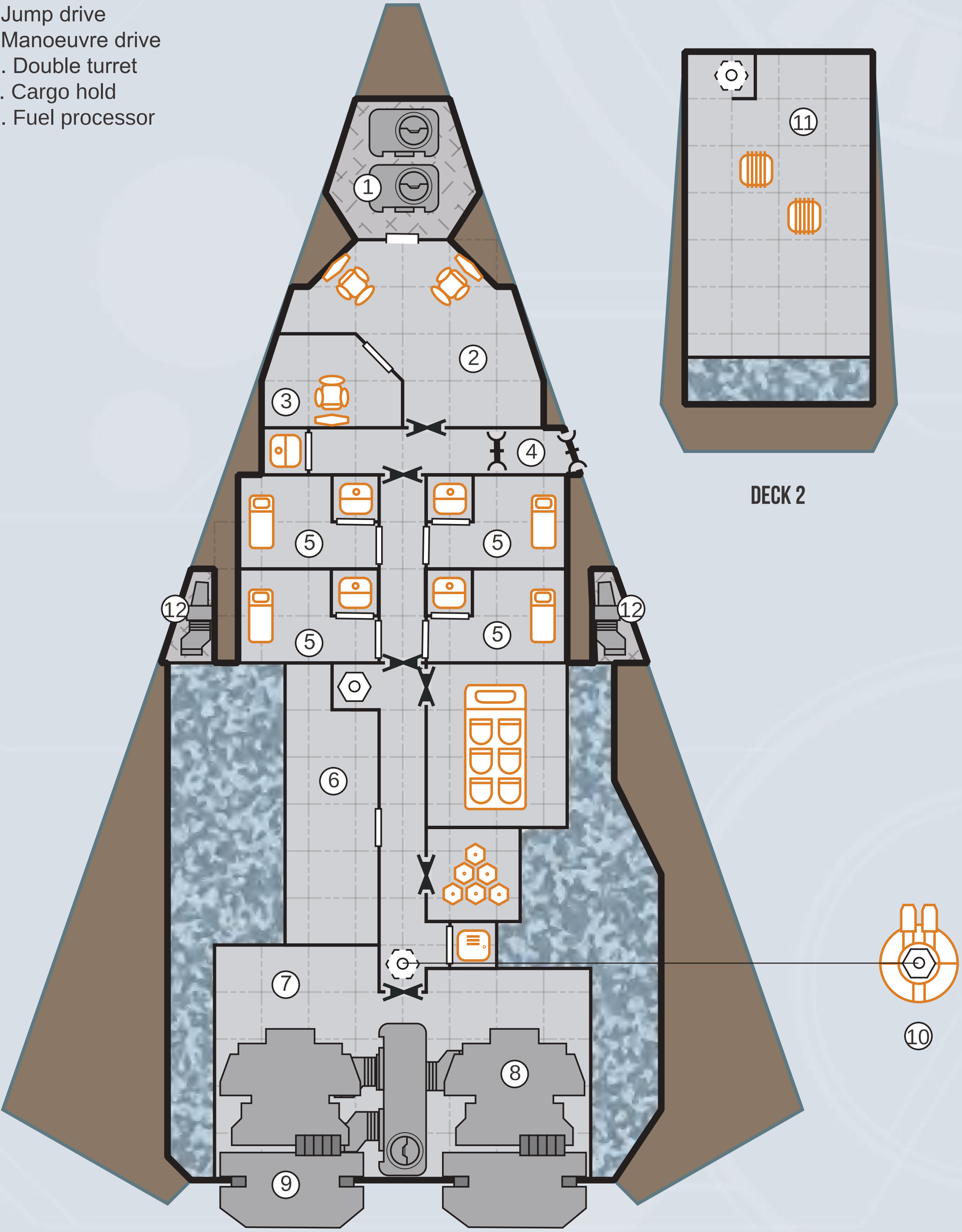
Basic Ship Systems	20
Manoeuvre Drive	20
Jump Drive	20
Sensors	2
Fuel Processor	2

SCOUT
COURIER

1 square = 0.5 Ton

LEGEND

1. Sensors
2. Bridge
3. Office
4. Airlock
5. Stateroom
6. Workshop
7. Power plant
8. Jump drive
9. Manoeuvre drive
10. Double turret
11. Cargo hold
12. Fuel processor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DECK 1

SEEKER MINING SHIP

TYPE: J

A variation on the traditional scout/courier, the seeker is occasionally produced in this configuration by shipyards but it is more commonly a refitted old scout retired from active service. A seeker has fewer staterooms and a smaller fuel tank but its larger cargo bay and prospecting buggy allow a single well-skilled prospector to scavenge asteroids and make a living looking for deposits of valuable minerals. While Seekers can be operated by a lone pilot/astrogator, most include additional crew in order to mine and process ore at a faster rate. This variant of the seeker forgoes the use of mining drones, replacing them with a prospecting buggy, used to rove a mining crew on the exterior of asteroids.

TL12		Tons	Cost (MCr)
Hull	100 tons, Streamlined	—	6
Armour	Crystaliron, Armour: 4	6	1.2
M-Drive	Thrust 2	2	4
J-Drive	Jump 2	10	15
Power Plant	Fusion (TL12), Power 60	4	4
Fuel Tanks	J-2, 4 weeks of operation	21	—
Bridge		10	0.5
Computer	Computer/5bis	—	0.045
Sensors	Military Grade	2	4.1
Weapons	Double Turret (empty)	1	0.5
Craft	Docking Space (4 tons)	5	1.25
	Prospecting Buggy	—	0.27
Systems	Fuel Processor (20 tons/day)	1	0.05
	Fuel Scoops	—	—
Staterooms	Standard x2	8	1
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Cargo		30	—
Total: MCr38.115			

Crew

Pilot, Astrogator, Engineer

Hull: 40

Running Costs

MAINTENANCE COST

Cr2859/month

PURCHASE COST

MCr34.3035

Power Requirements

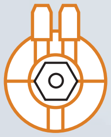
Basic Ship Systems	20
Manoeuvre Drive	20
Jump Drive	20
Sensors	2
Fuel Processor	1

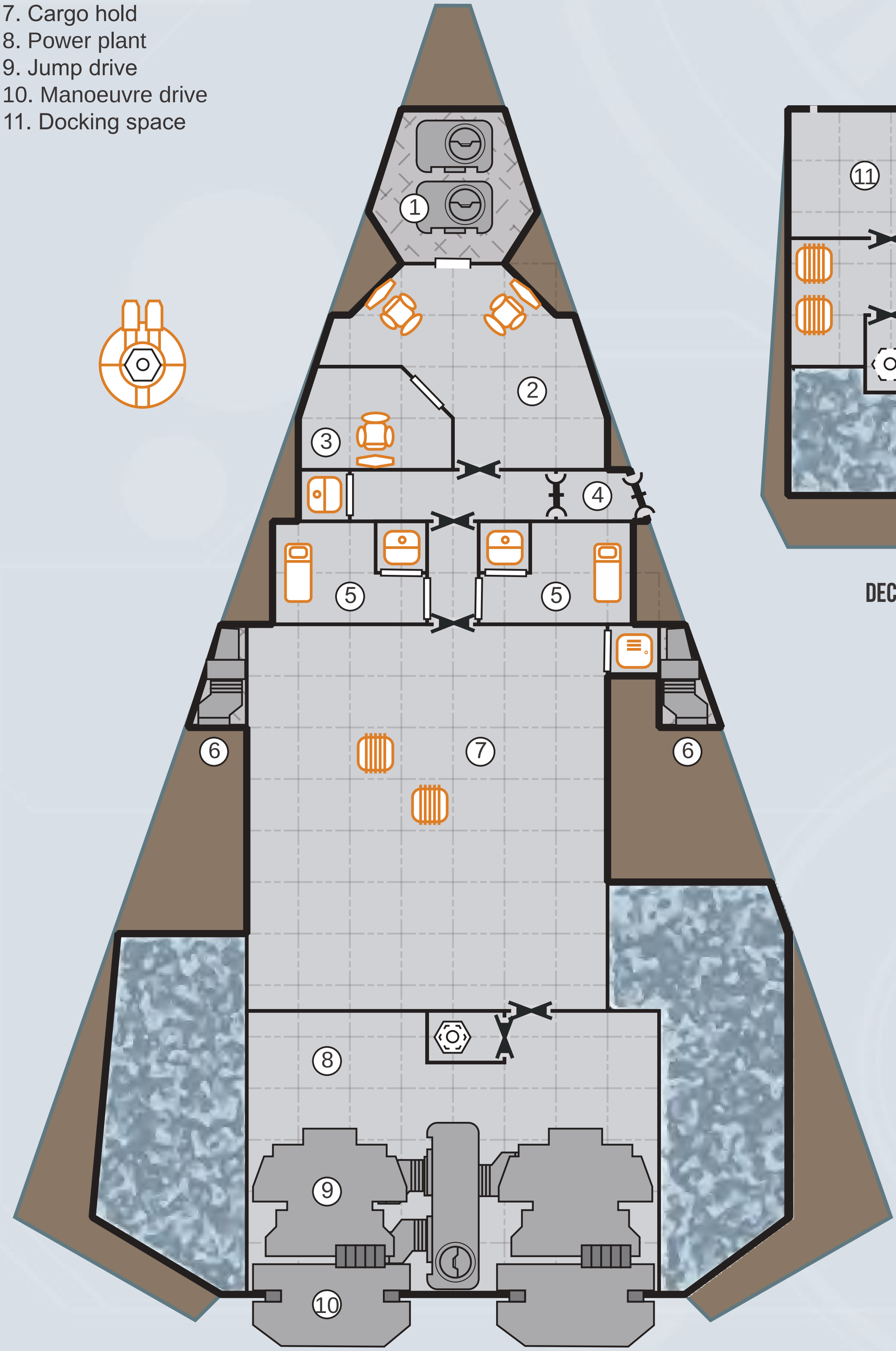
SEEKER MINING SHIP

LEGEND

1. Sensors
2. Bridge
3. Office
4. Airlock
5. Stateroom
6. Fuel processor
7. Cargo hold
8. Power plant
9. Jump drive
10. Manoeuvre drive
11. Docking space

1 square = 0.5 Ton





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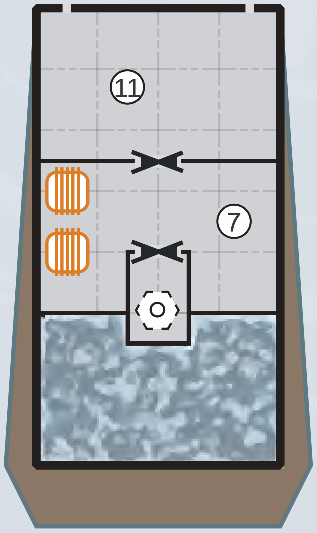

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PROSPECTING BUGGY

The prospecting buggy is a simple, venerable tool of miners across the Third Imperium. Standard practice is to transport three miners, possibly with strength-enhancing exoskeletons and carrying portable laser drills to a location, fold away the passenger seats (increasing cargo space to 1.5 tons total), then use the buggy to ferry ore between the mining site and a base camp (typically a Type-J seeker or ore-processing facility). The crane is equipped with short-range gravitic plates and a gripping claw to scoop up loose ore quickly, whether planetside or in space, with sufficient articulation to deposit it into the buggy. Skilled pilots often use the buggy's gravitic plating to speed up loading and unloading. Unlike prior generations of buggies, the modern version is not vacuum-sealed, instead relying on the crew to wear appropriate environmental protection.

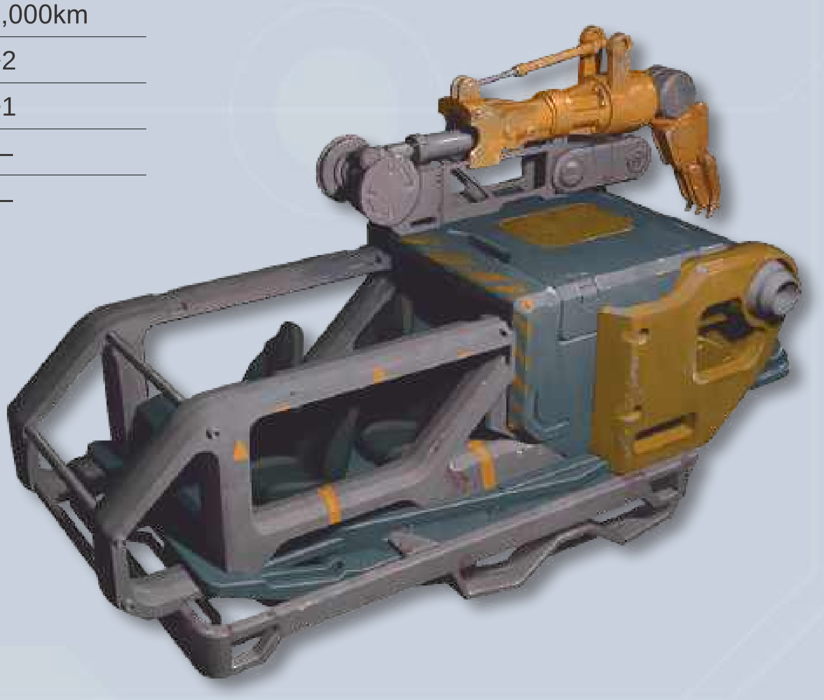
TL	12
Skill	Flyer (grav)
Agility	+1
Speed (cruise)	Fast (High)
Range (cruise)	3,000 (4,500)
Crew	1
Passengers	3
Cargo	0.75 tons
Hull	16
Shipping	4 tons
Cost	Cr270000

Armour

Front	4
Sides	4
Rear	4

Traits	—
Equipment	Autopilot (basic), Computer/3 (with communications system), Crane (light), Navigation System (improved), Sensor System (improved)

Equipment	
Autopilot (skill level)	0
Communications (range)	1,000km
Navigation (Navigation DM)	+2
Sensors (Electronics (sensors) DM)	+1
Camouflage (Recon DM)	—
Stealth (Electronics (sensors) DM)	—



CLASS: SERPENT

Similar to the performance of the venerable Type-S, the *Serpent* features better aerodynamic performance and some technological advances. *Serpent*-class ships are highly sought after and usually allotted to senior scouts with records of exemplary service.

Names reported in use for the *Serpent* include *Asp*, *Cobra*, *Deceiver*, *Eel*, *Python*, *Reptile*, *Snake* and *Viper*.

TL14		Tons	Cost (MCr)
Hull	100 tons, Streamlined	—	6
	Aerofins	5	0.5
Armour	Bonded Superdense, Armour: 4	3.84	1.92
M-Drive	Thrust 2	2	4
J-Drive	Jump 2	10	15
Power Plant	Fusion (TL12), Power 60	4	4
Fuel Tanks	J-2, 8 weeks of operation	22	—
Bridge		10	0.5
Computer	Computer/5bis	—	0.045
Sensors	Military Grade	2	4.1
	Life Scanner Analysis Suite	1	4
Weapons	Double Turret (empty)	1	0.5
Craft	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Advanced Probe Drones x10	2	1.6
	Fuel Processor (40 tons/day)	2	0.1
	Fuel Scoops	—	—
	Workshop	6	0.9
Staterooms	Standard x4	16	2
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Common Areas		1	0.1
Cargo		7.16	—
Total: MCr46.965			

Crew

Pilot, Astrogator, Engineer

Hull: 40

Running Costs

MAINTENANCE COST

Cr3522/month

PURCHASE COST

MCr42.2685

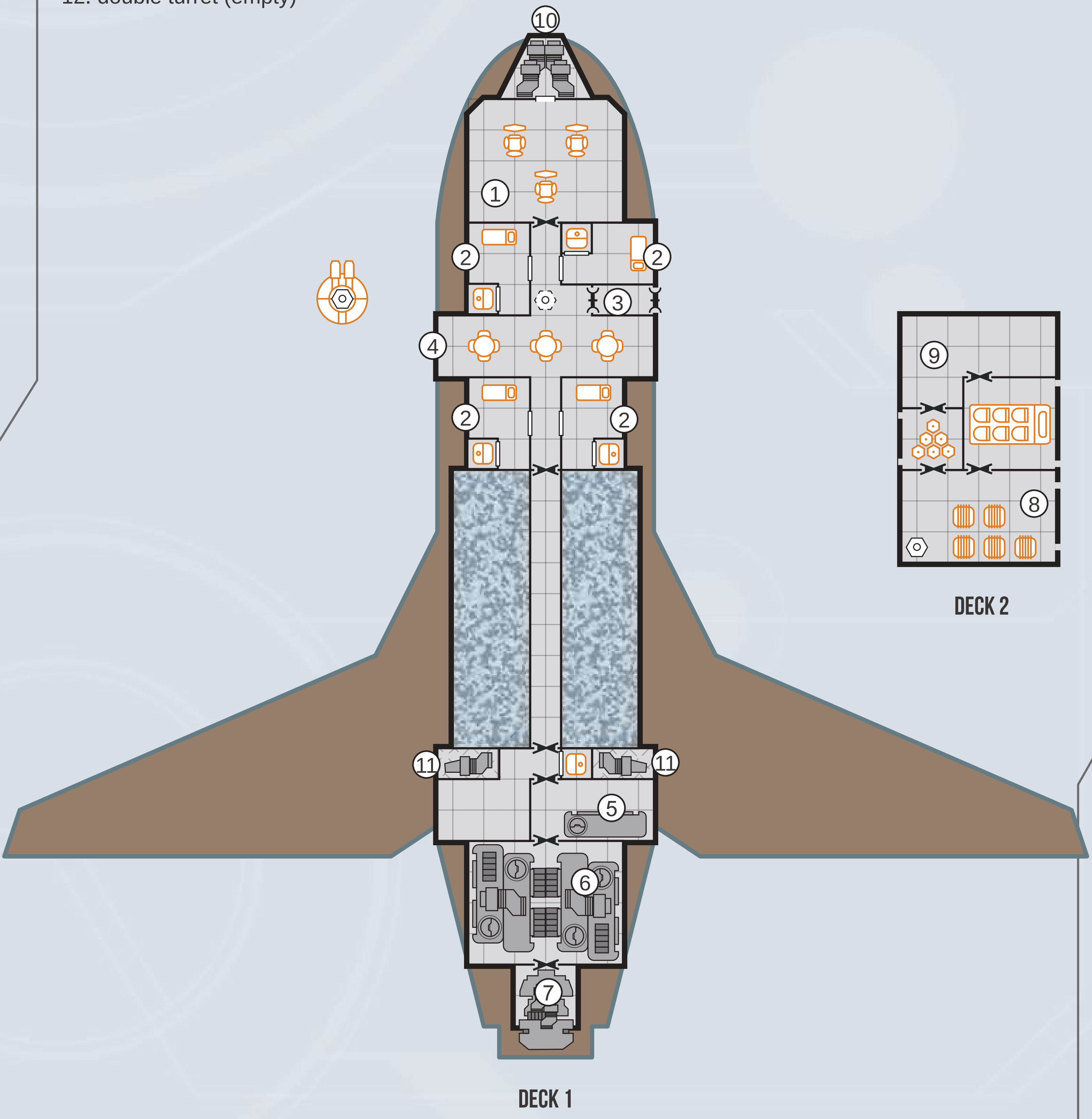
Power Requirements

Basic Ship Systems	20
Manoeuvre Drive	20
Jump Drive	20
Sensors	3
Weapons	1
Fuel Processor	2

SERPENT SCOUT

1 square = 0.5 Ton

LEGEND
1. Bridge
2. Stateroom
3. Airlock
4. Common area
5. Power plant
6. Jump drive
7. Manoeuvre drive
8. Cargo hold
9. Workshop
10. Sensors
11. Fuel processor
12. double turret (empty)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DECK 2

The *Empress Marava* far trader can be encountered anywhere in the Imperium. It ranges far and wide, dealing with every world it finds. Even amber zones and red zones are not considered off limits by its captains, provided there is profit to be made and the risk of being caught is slight. The double turrets and air/raft give this ship some versatility compared to the Type-A2 far trader.

TL12		Tons	Cost (MCr)
Hull	200 tons, Streamlined	—	12
M-Drive	Thrust 1	2	4
J-Drive	Jump 2	15	22.5
Power Plant	Fusion (TL12), Power 90	6	6
Fuel Tanks	J-2, 4 weeks of operation	41	—
Bridge		10	1
Computer	Computer/5bis	—	0.045
Sensors	Civilian Grade	1	3
Weapons	Double Turrets (beam lasers) x2	2	3
Craft	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Fuel Processor (40 tons/day)	2	0.1
	Fuel Scoops	—	—
	Loading Belt (TL7)	1	0.003
	Cargo Airlocks x2	6	0.6
Staterooms	Standard x10	40	5
	Low Berths x4	2	0.2
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Common Areas		10	1
Cargo		57	—
Total: MCr60.148			

Crew

Pilot/Astrogator, Engineer, Steward, Gunners x2

Hull: 80

Running Costs

MAINTENANCE COST

Cr4513/month

PURCHASE COST

MCr54.1582

Power Requirements

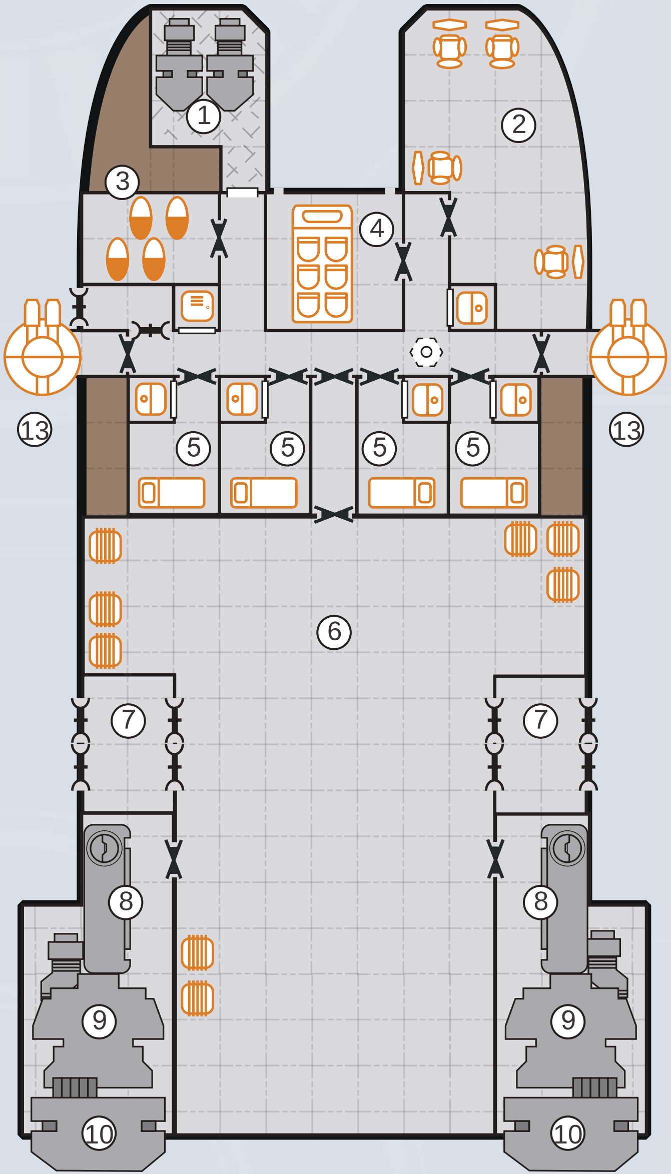
Basic Ship Systems	40
Manoeuvre Drive	20
Jump Drive	40
Sensors	1
Weapons	18
Fuel Processor	2
Loading Belt	1
Low Berths	1

EMPRESS MARAVA FAR TRADER

1 square = 0.5 Ton

LEGEND

1. Sensors
2. Bridge
3. Low berths
4. Docking space
5. Stateroom
6. Cargo hold
7. Cargo airlock
8. Power plant
9. Jump drive
10. Manoeuvre drive
11. Common area
12. Fuel processor
13. Beam laser turret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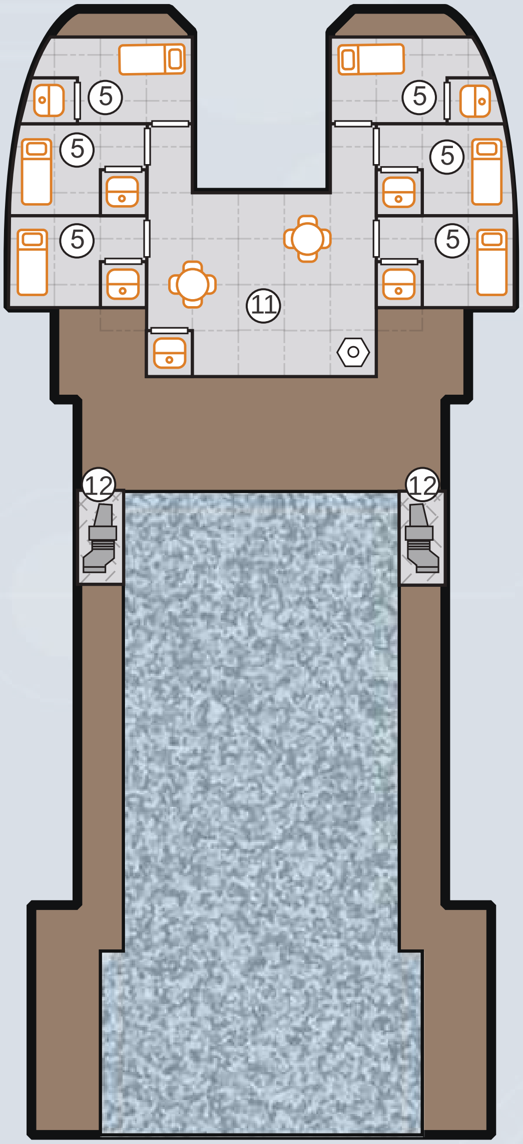
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DECK 2

FAR TRADER

TYPE: A2 (HERO CLASS)

While nominally a modified free trader, the far trader has a series of modifications that have become accepted as standard and many free traders are either modified to this specification or are built this way from new. The far trader swaps cargo space and low berths for a larger jump drive and fuel tank, allowing it to reach systems a basic free trader cannot travel to. While less cargo can mean fewer profits, the ability to reach more distant systems and to travel between stars at a faster rate can more than make up for this in the hands of a clever captain. Due to its tight power budget, the ship must shut down its manoeuvre drive and engage in 'jump dimming' – dimming the lights and otherwise briefly powering off some systems – to have enough power to jump.

TL12		Tons	Cost (MCr)
Hull	200 tons, Streamlined	—	12
Armour	Crystaliron, Armour: 2	6	1.2
M-Drive	Thrust 1	2	4
J-Drive	Jump 2	15	22.5
Power Plant	Fusion (TL12), Power 75	5	5
Fuel Tanks	J-2, 4 weeks of operation	41	—
Bridge		10	1
Computer	Computer/5bis	—	0.045
Sensors	Civilian Grade	1	3
Systems	Fuel Processor (40 tons/day)	2	0.1
	Fuel Scoops	—	—
	Cargo Crane	3	3
Staterooms	Standard x10	40	5
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Common Areas		10	1
Cargo		65	—
Total: MCr58.045			

Crew

Pilot, Astrogator, Engineer, Steward

Hull: 80

Running Costs

MAINTENANCE COST

Cr4353/month

PURCHASE COST

MCr52.2405

Power Requirements

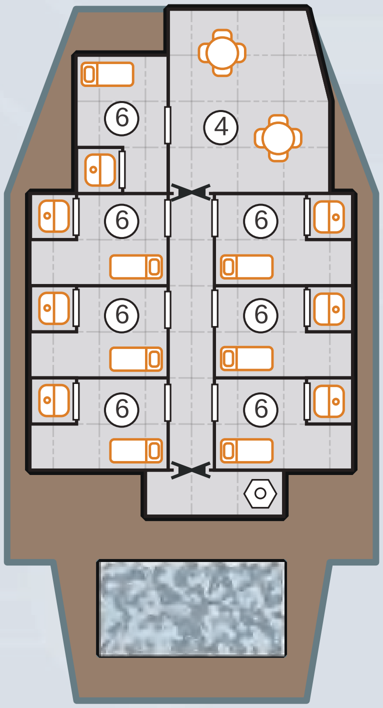
Basic Ship Systems	40
Manoeuvre Drive	20
Jump Drive	40
Sensors	1
Fuel Processor	2

TYPE A2 FAR TRADER

LEGEND

1. Sensors
2. Bridge
3. Office
4. Common area
5. Airlock
6. Stateroom
7. Cargo hold
8. Fuel processor
9. Power plant
10. Jumpdrive
11. Manoeuvre drive

1 square = 0.5 Ton



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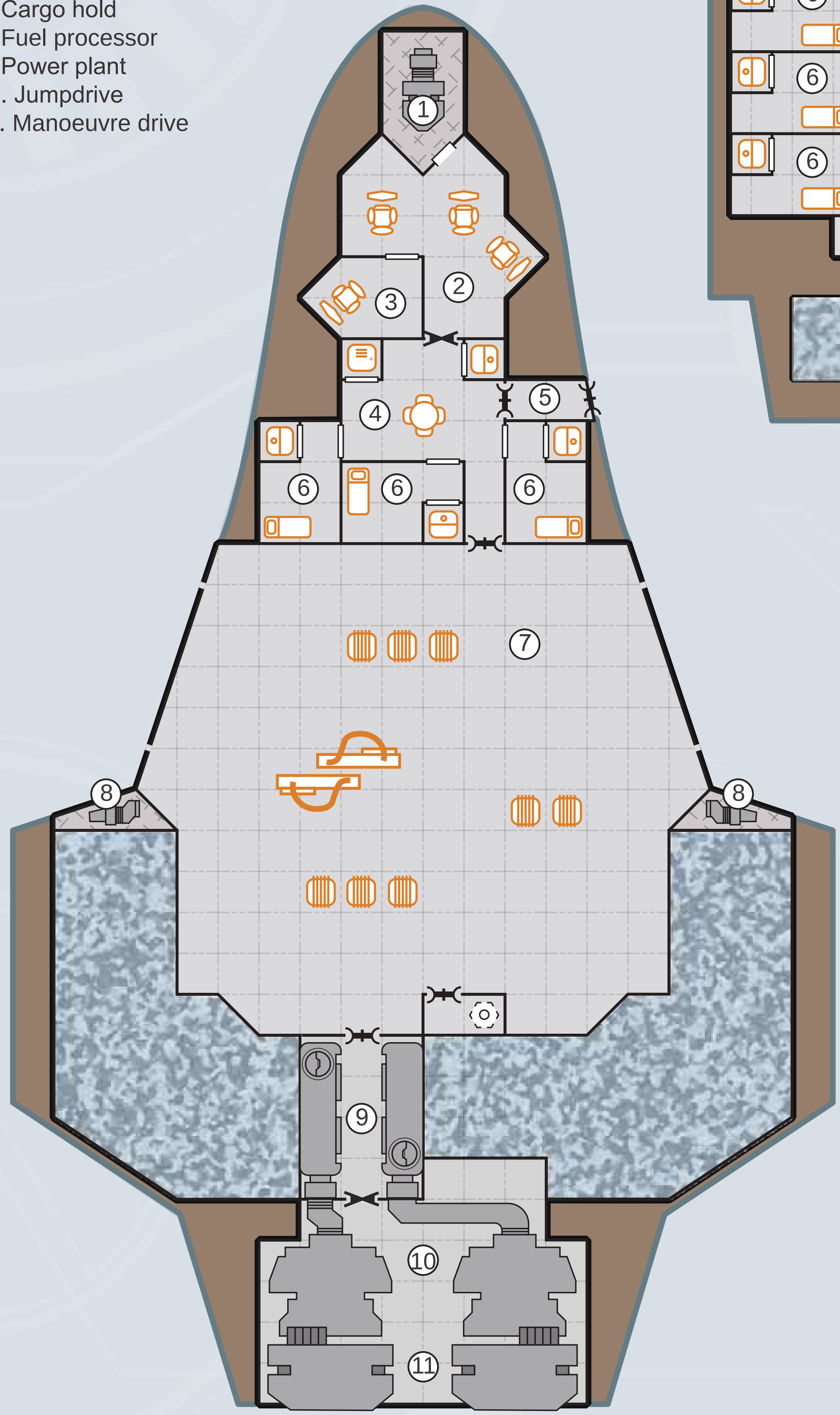

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DECK 1

FREE TRADER

TYPE: A (BEOWULF CLASS)

Using a 200-ton hull, the free trader is an elementary interstellar merchant ship designed to ply the space lanes while carrying a mixture of cargo and passengers. It is the archetypal tramp freighter and common among adventuring groups and mercenary bands, often retrofitted with turrets, weapons and other 'special' modifications. As such, actual specifications can vary wildly, often being proportional to the age of the ship but the free trader presented here is typical of a vessel fresh out of the shipyard. A steward and a medic are recommended to take care of high and low passengers, respectively, but are not strictly required.

TL12		Tons	Cost (MCr)
Hull	200 tons, Streamlined	—	12
Armour	Crystaliron, Armour: 2	6	1.2
M-Drive	Thrust 1	2	4
J-Drive	Jump 1	10	15
Power Plant	Fusion (TL12), Power 75	5	5
Fuel Tanks	J-1, 4 weeks of operation	21	—
Bridge		10	1
Computer	Computer/5	—	0.03
Sensors	Civilian Grade	1	3
Systems	Fuel Processor (20 tons/day)	1	0.05
	Fuel Scoops	—	—
	Cargo Crane	3	3
Staterooms	Standard x10	40	5
	Low Berth x20	10	1
Software	Manoeuvre	—	—
	Jump Control/1	—	0.1
	Library	—	—
	Intellect	—	—
Common Areas		10	1
Cargo		80	—
Total: MCr51.38			

Crew

Pilot, Astrogator, Engineer, Steward

Hull: 80

Running Costs

MAINTENANCE COST

Cr3854/month

PURCHASE COST

MCr46.242

Power Requirements

Basic Ship Systems
40

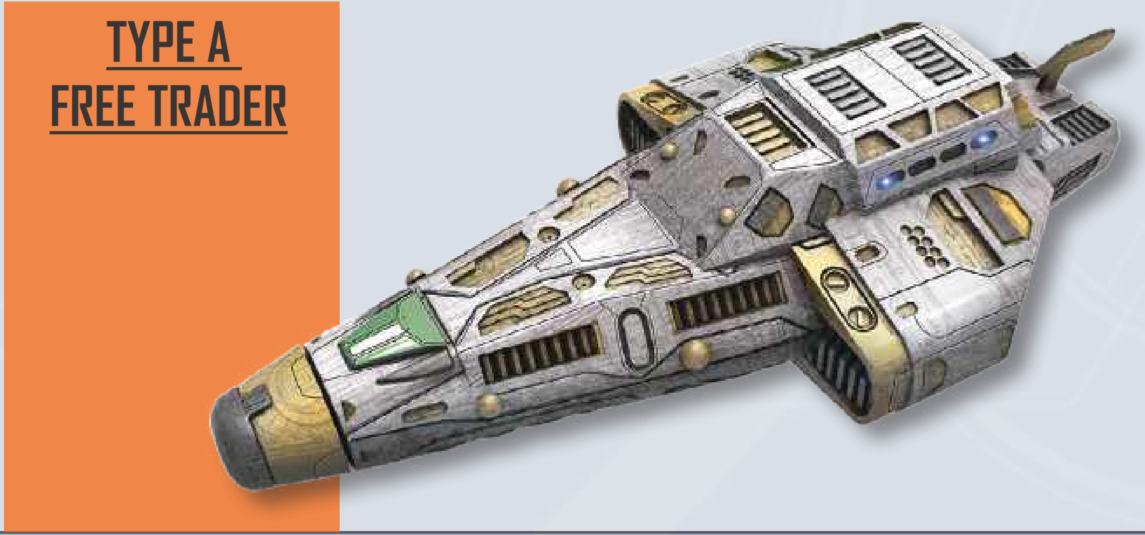
Manoeuvre Drive
20

Jump Drive
20

Sensors
1

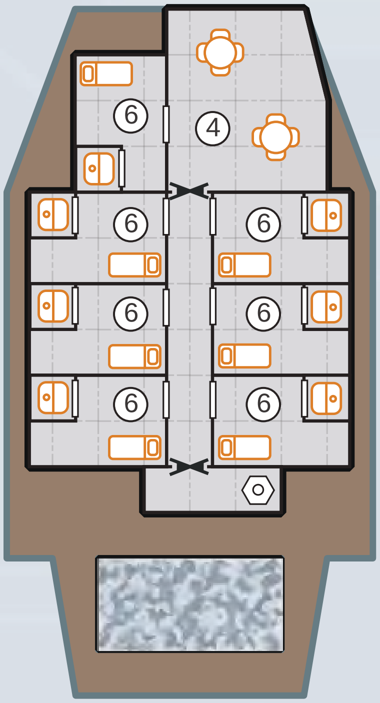
Fuel Processor
1

Low Berths
2



LEGEND
1. Sensors
2. Bridge
3. Office
4. Common area
5. Airlock
6. Stateroom
7. Cargo hold
8. Fuel processor
9. Low berths
10. Power plant
11. Jump drive
12. Manoeuvre drive

1 square = 0.5 Ton



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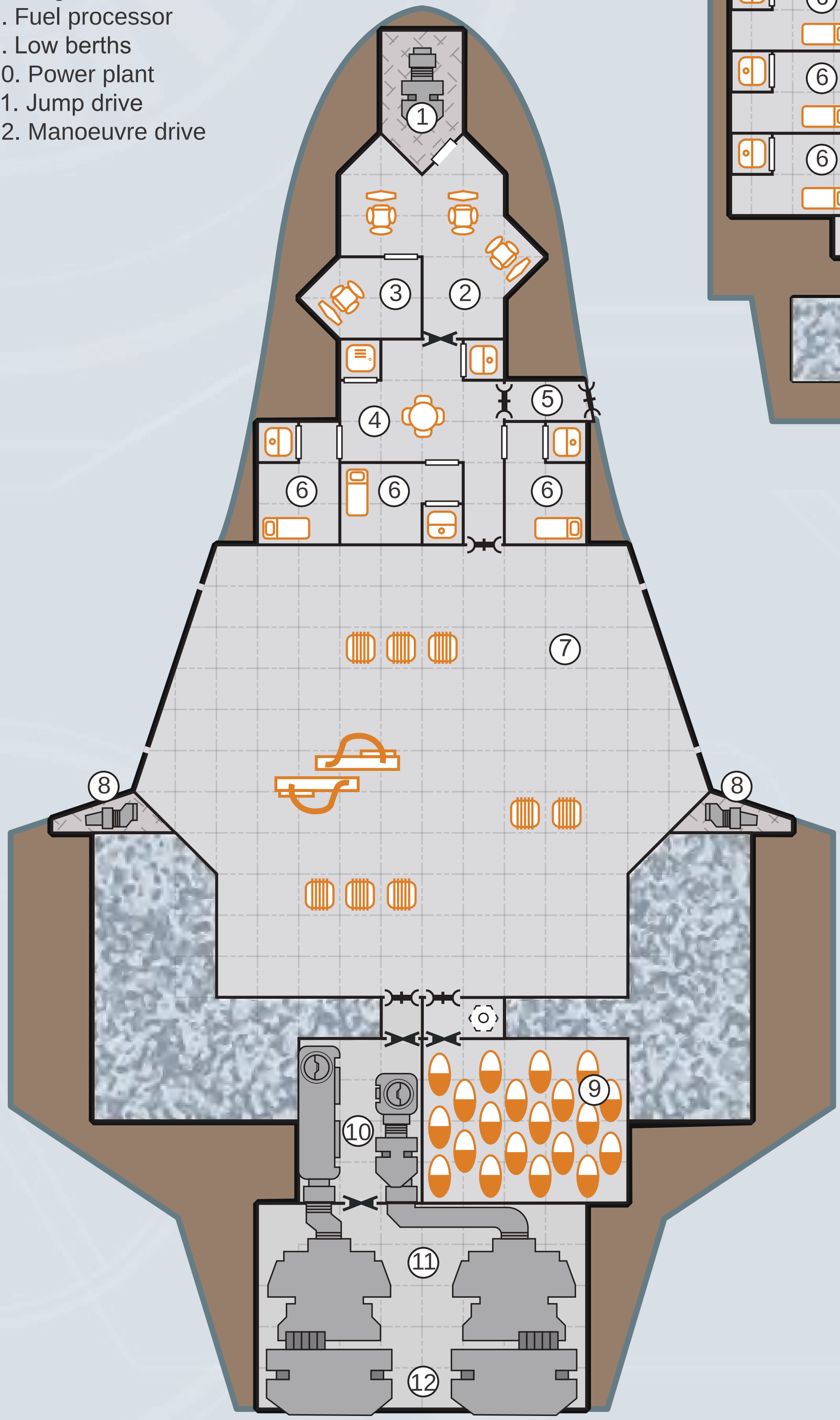
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DECK 1

SAFARI SHIP

TYPE: K (ANIMAL CLASS)

Although at first appearance uniquely specialised, the safari ship is relatively common throughout the galaxy. It is primarily designed as an excursion vessel, capable of conducting trophy-taking expeditions (photographic or real) to distant worlds, all in a high degree of comfort. Indeed, some owners will outfit their safari ship to higher standards of luxury than many yachts. Included are two eight-ton holding tanks with variable environments for live specimens and a trophy lounge that makes for a very comfortable mess area for passengers and crew. While the ship is streamlined and can land on the surface of a planet, a launch and ATV enable expeditions without requiring the whole vessel to leave orbit. Additional crew, such as a steward and a medic, are often brought along to facilitate safaris but are not needed for basic ship operation. Descriptions of the ATV and air/raft can be found in the *Vehicle Handbook*.

TL12		Tons	Cost (MCr)
Hull	200 tons, Streamlined	—	12
M-Drive	Thrust 1	2	4
J-Drive	Jump 2	15	22.5
Power Plant	Fusion (TL12), Power 105	7	7
Fuel Tanks	J-2, 4 weeks of operation	41	—
Bridge		10	1
Computer	Computer/5bis	—	0.045
Sensors	Civilian Grade	1	3
Weapons	Double Turret (empty)	1	0.5
Craft	Docking Space (20 tons)	22	5.5
	Launch	—	2.63
	ATV (on launch)	—	0.155
	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Fuel Processor (40 tons/day)	2	0.1
	Fuel Scoops	—	—
	Multi-Environment Equipment	0.8	0.4
	Multi-Environment Holding Tanks	16	—
Staterooms	Standard x11	44	5.5
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Common Areas	—	13	1.3
	Trophy Lounge	7	0.7
Cargo		13.2	—
Total: MCr68.03			

Crew

Pilot, Astrogator, Engineer, Medic, Steward

Hull: 80

Running Costs

MAINTENANCE COST

Cr5103/month

PURCHASE COST

MCr61.227

Power Requirements

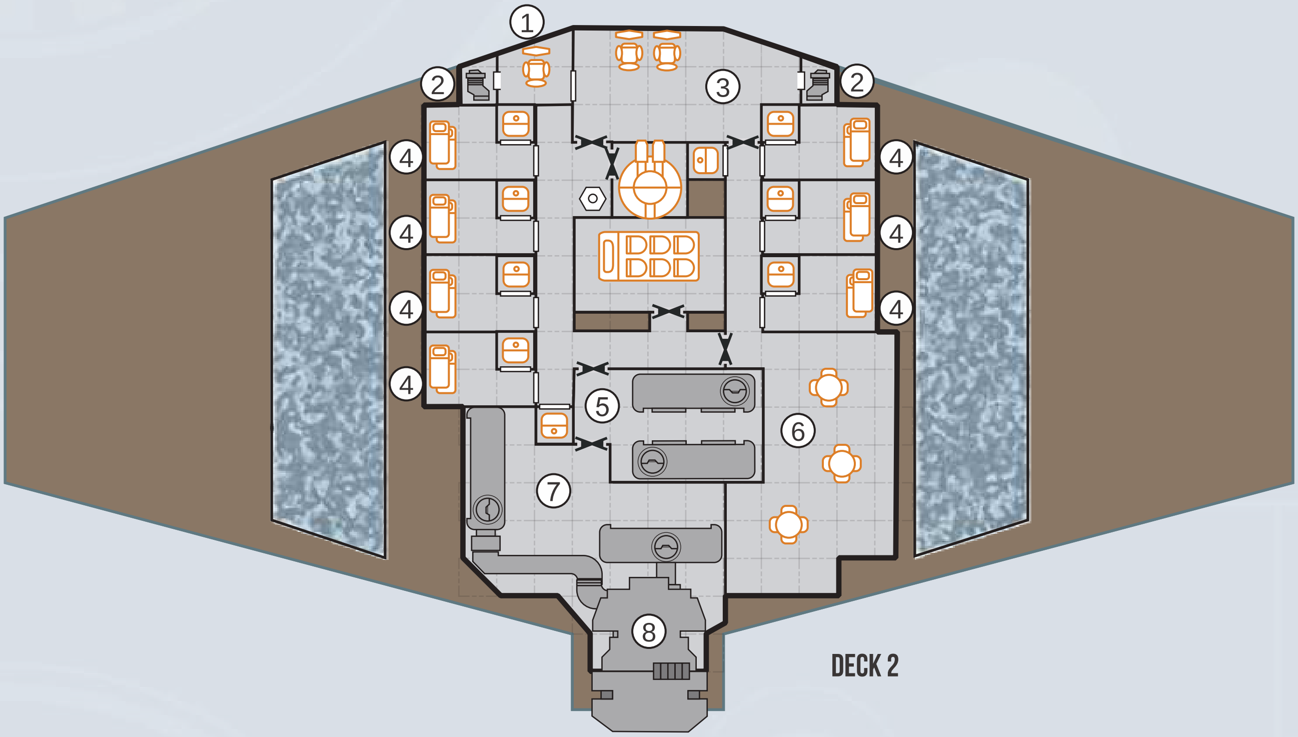
Basic Ship Systems	40
Manoeuvre Drive	20
Jump Drive	40
Sensors	1
Fuel Processor	2
Multi-Environment Equipment	1

TYPE K SAFARI SHIP

1 square = 0.5 Ton

LEGEND

1. Bridge office
2. Sensors
3. Bridge
4. Stateroom
5. Power plant
6. Common area
7. Jump drive
8. Manoeuvre drive
9. Trophy lounge
10. Fuel processor
11. Cargo hold
12. Multi-Environment Holding Tanks
13. Docking space
14. Airlock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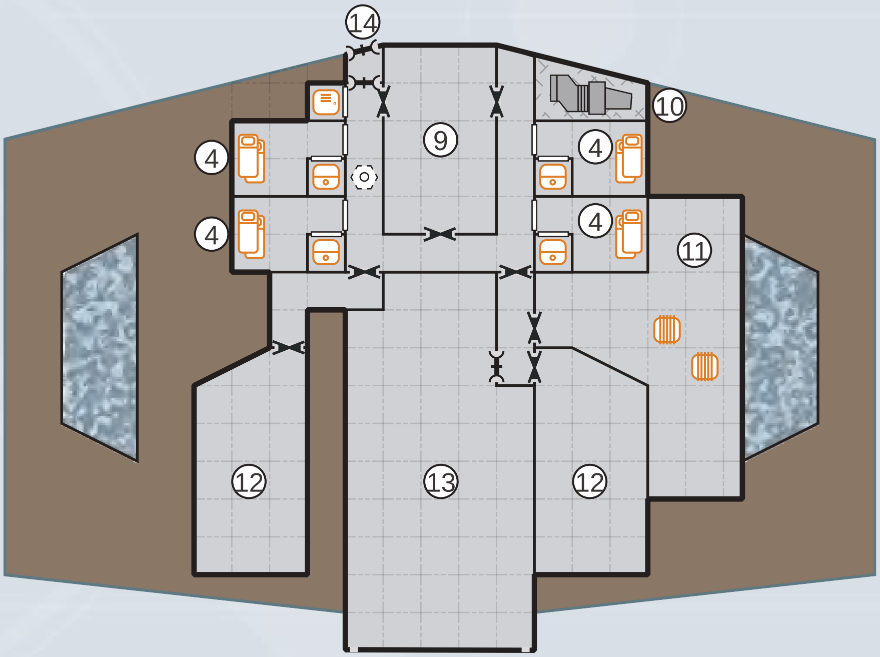
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DECK 1

SYSTEM DEFENCE BOAT

The range of possible system defence boat (SDB) configurations is huge, if not actually infinite. This example is typical for TL15 systems; heavily armoured and equipped with both missile and laser weaponry. Its function is to operate within a star system and defend it from invading forces. SDBs can be used in space combat against starships or they may be pressed into service as air and orbital superiority craft in operations against ground forces.

Because SDBs have no jump drives, shifting them from system-to-system can be a problem. Some have jump shuttles which attach themselves to the boat and provide jump capability. Another method is simple transport in larger ships; the SDBs are loaded into 10,000- or 20,000-ton bulk carriers for the multi-parsec journey.

TL15		Tons	Cost (MCr)
Hull	200 tons, Standard	—	10
	Reinforced	—	5
Armour	Crystaliron, Armour: 13	32.5	6.5
	'Radiation Shielding	—	5
M-Drive	Thrust 9	18	36
Power Plant	Fusion (TL12), Power 240	16	16
Fuel Tanks	12 weeks of operation	6	—
Bridge	Holographic Controls	10	1.25
Computer	Computer/35	—	30
Sensors	Improved	3	4.3
	Countermeasures Suite	2	4
Weapons	Triple Turret (beam lasers)	1	2.5
	Triple Turret (missile racks)	1	3.25
Ammunition	Missile Storage (240 missiles)	20	—
Armoured Bulkheads	Bridge	1	0.2
	Manoeuvre Drive	1.8	0.36
	Power Plant	1.6	0.32
	Sensors	0.5	0.1
Systems	Fuel Scoops	—	1
	Fuel Processor (20 tons/day)	1	0.05
	Repair Drones	2	0.4
	Medical Bay	4	2
Staterooms	Standard x15	60	7.5
Software	Auto-Repair/1	—	5
	Evade/2	—	2
	Fire Control/2	—	4
	Intellect	—	—
	Library	—	—
	Manoeuvre	—	—
Common Areas		4	0.4
Cargo		14.6	—
Total: MCr147.13			

Crew

Captain, Pilots x3, Engineer, Maintenance, Medic, Gunners x4, Administrator, Officer

Hull: 88

Running Costs

MAINTENANCE COST

Cr11035/month

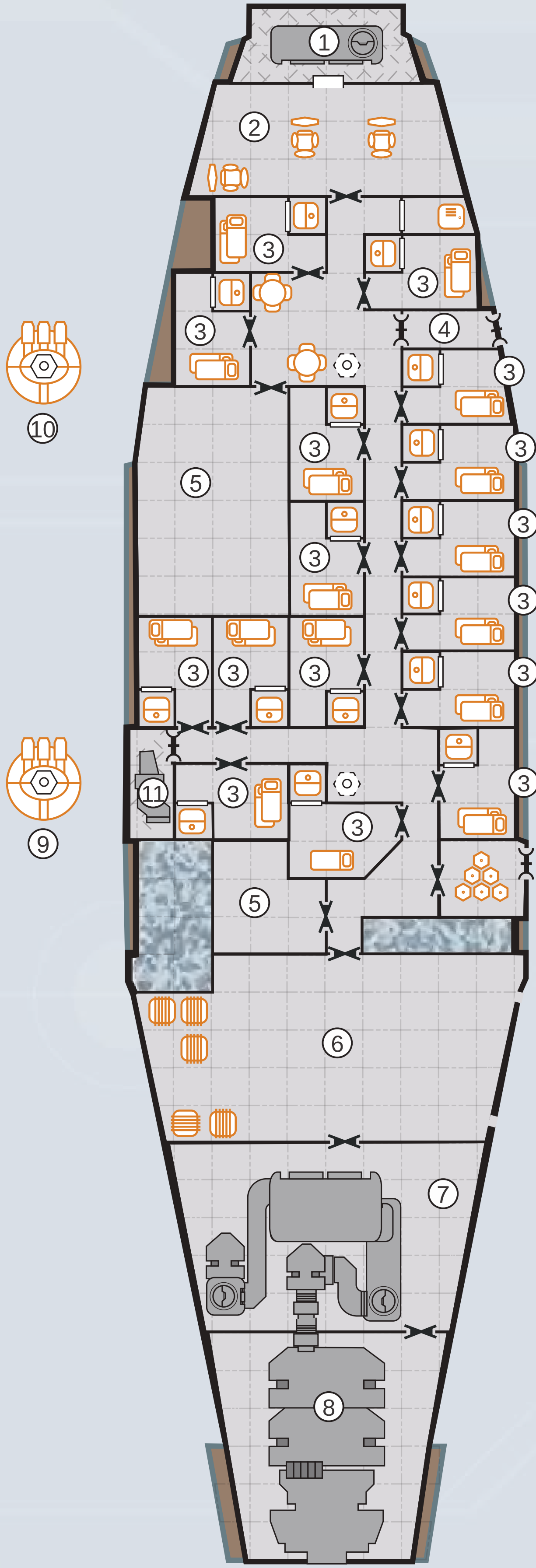
PURCHASE COST

MCr132.417

Power Requirements

Basic Ship Systems	40
Manoeuvre Drive	180
Sensors	5
Weapons	14
Medical Bay	1
Fuel Processor	1

1 square = 0.5 Ton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LEGEND

1. Sensors
2. Bridge
3. Stateroom
4. Airlock
5. Missile storage
6. Cargo hold
7. Power plant
8. Manoeuvre drive
9. Beam laser
10. Missile racks
11. Fuel processor

JUMP SHUTTLE

Jump shuttles fill an important need: They enable the transportation of ships incapable of jump such as system defence boats and in-system bulk haulers, as well as the recovery of disabled starships from systems lacking repair facilities. Jump shuttles are usually little more than drives, fuel and the minimum crew and facilities necessary to run them.

This example is capable of Thrust 3 and Jump 3 on its own, Thrust 2 and Jump 2 while carrying a ship up to 100 tons or Thrust 1 and Jump 1 while carrying a ship up to 400 tons. In all cases, sufficient fuel is provided to make two consecutive jumps without refuelling.

TL13		Tons	Cost (MCr)
Hull	200 tons, Standard	—	10
M-Drive	Thrust 3	6	12
Jump Drive	Jump 3 (reduced fuel)	20	33
Power Plant	Fusion (TL12), Power 105	7	7
Fuel Tanks	J-3 x2, 4 weeks of operation	115	—
Bridge	Smaller Bridge	6	0.5
Computer	Computer/10bis	—	0.24
Sensors	Civilian Grade	1	3
Systems	Fuel Scoops	—	1
	Fuel Processor (60 tons/day)	3	0.15
	Docking Clamp (Type III)	10	2
	Docking Clamp (Type IV)	20	4
Staterooms	Standard x2	8	1
Software	Intellect	—	—
	Jump Control/3	—	0.3
	Library	—	—
	Manoeuvre	—	—
Common Areas		2	0.2
Cargo		2	—
	Total: MCr74.39		

Crew

Pilot, Astrogator, Engineers

Hull: 80

Running Costs

MAINTENANCE COST

Cr5580/month

PURCHASE COST

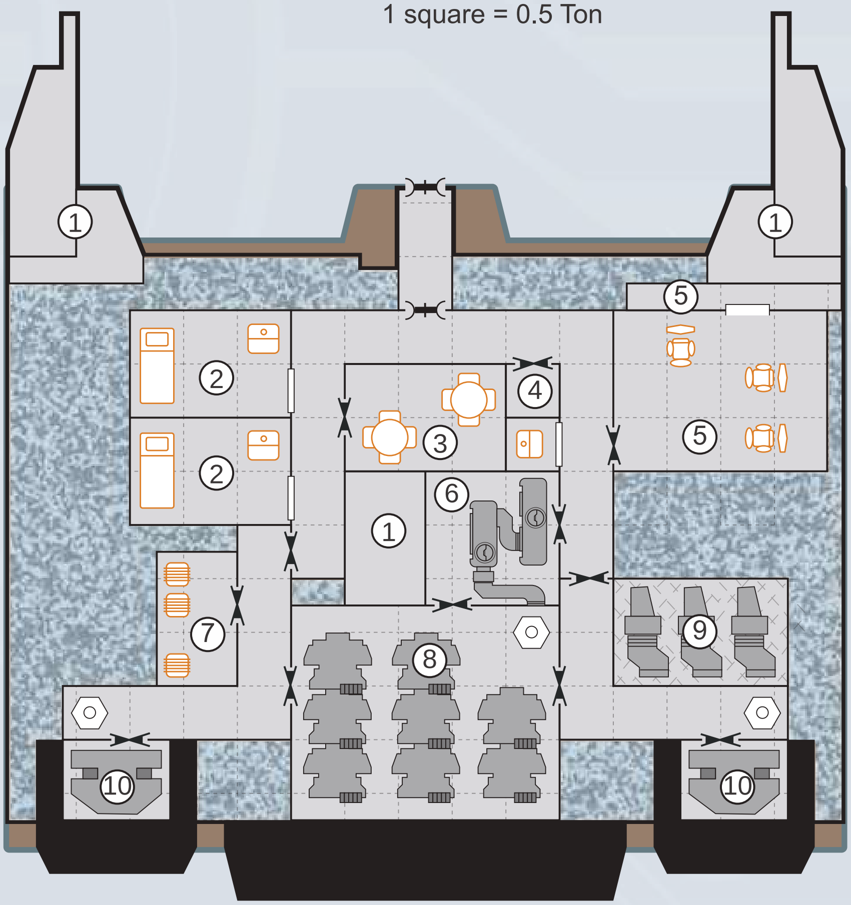
MCr66.951

Power Requirements

Basic Ship Systems	40
Manoeuvre Drive	60
Jump Drive	60
Sensors	1
Furl Processor	3

JUMP SHUTTLE

1 square = 0.5 Ton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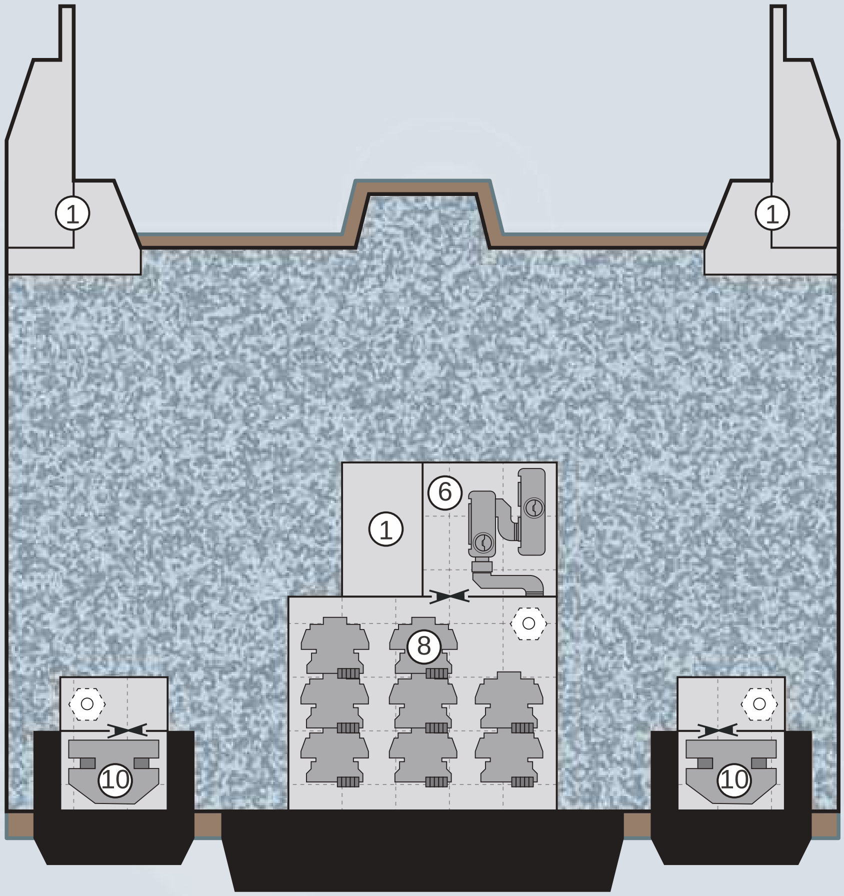


DECK 1

LEGEND

1. Clamps
2. Stateroom
3. Common area
4. Storage
5. Bridge
6. Power plant
7. Cargo hold
8. Jump drive
9. Fuel processor
10. Manoeuvre drive

YACHT

TYPE: Y

The yacht is a noble's plaything, used to entertain friends and undertake political or commercial missions. The staterooms are all well-appointed but even they fail to make the grade in comparison to the luxury stateroom intended for the yacht's owner. The yacht carries an air/raft and a ship's boat within docking compartments; an ATV is also carried, with the ship's boat being used to ferry it from orbit to surface and back again.

TL12		Tons	Cost (MCr)
Hull	200 tons, Standard	—	10
M-Drive	Thrust 1	2	4
J-Drive	Jump 1	10	15
Power Plant	Fusion (TL12), Power 90	6	6
Fuel Tanks	J-1, 8 weeks of operation	22	—
Bridge		10	1
Computer	Computer/5	—	0.03
Sensors	Civilian Grade	1	3
Weapons		—	—
Craft	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
	Docking Space (30 tons)	33	8.25
	Ship's Boat	—	7.58
	ATV (on ship's boat)	—	0.155
Systems	Fuel Processor (20 tons/day)	1	0.05
	Gourmet Kitchen (6 diners)	6	1.2
	Hot Tub (4 seats)	1	0.012
	Theatre	8	1.6
	Wet Bar	—	0.002
	Studio (salon)	4	0.4
	Training Facilities (gym)	4	0.8
Staterooms	Standard x12	48	6
	Luxury	10	1.5
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
	Jump Control/1	—	0.1
Common Areas		13	1.3
Cargo		16	—
Total: MCr69.479			

Crew

Pilot, Astrogator, Engineer, Medic, Steward

Hull: 80

Running Costs

MAINTENANCE COST

Cr5211/month

PURCHASE COST

MCr62.5311

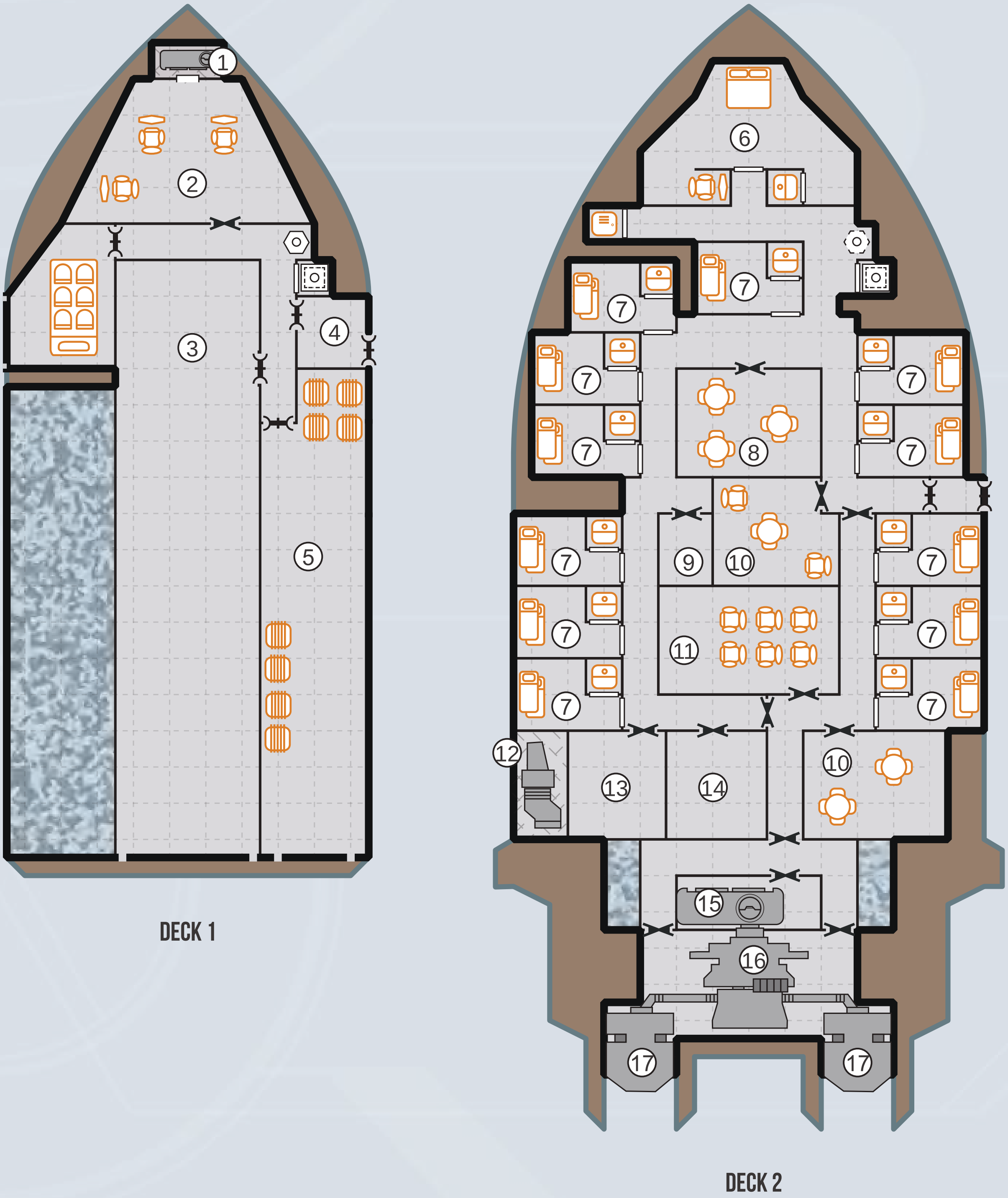
Power Requirements

Basic Ship Systems	40
Manoeuvre Drive	20
Jump Drive	20
Sensors	1
Furl Processor	1
Training Facilities	1

YACHT

LEGEND
1. Sensors
2. Bridge
3. Docking space
4. Airlock
5. Cargo hold
6. Luxury stateroom
7. Stateroom
8. Kitchen
9. Hot tub
10. Common area
11. Theatre
12. Fuel processor
13. Training area
14. Studio
15. Power plant
16. Jump drive
17. Manoeuvre drive

1 square = 0.5 Ton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CLOSE ESCORT

CLASS: GAZELLE

An outdated design meant to be built cheaply and in great numbers, hundreds of Gazelle-class close escorts remain in service in the Imperial Navy, despite the fact that in a combat situation, they are nearly worthless. The close escort, even when new, was not intended to stand up to combat vessels; rather it was envisioned as an anti-piracy and revenue patrol ship. In that role, it has performed well, but when pressed into combat duties it has invariably suffered disproportionate losses.

With 80-ton drop tanks (costing MCr 2) installed, the ship is capable of Jump-4 and Thrust 4. Jettisoning the drop tanks just before jump allows Jump-5; with internal tankage only, Jump-3 and Thrust 5 can be achieved

TL14		Tons	Cost (MCr)
Hull	400 tons, Close Structure	—	16
Armour	Bonded Superdense, Armour: 3	14.4	7.2
M-Drive	Thrust 5 (420 tons) (Increased Size)	26.25	31.5
J-Drive	Jump 5 (Energy Inefficient)	55	60
Power Plant	Fusion (TL12), Power 570 (Increased Size)	47.5	28.5
Fuel Tanks	Jump-3, plus 8 weeks of operation	130	—
High-Efficiency Batteries	TL12, 300 Power	5	1
Bridge	Smaller Bridge	10	1
Computer	Computer/20bis	—	7.5
Sensors	Military Grade	2	4.1
Weapons	Particle Barbettes x2	10	16
	Triple Turrets (Beam Lasers) x2	2	5
Craft	Docking Space (20 tons)	22	5.5
	Military Gig	—	15.187
Systems	Fuel Processor (200 tons/day)	10	0.5
	Fuel Scoops	—	1
	Drop Tanks Mount	0.32	0.16
	Armoury	1	0.25
	Medical Bay	4	2
Staterooms	Standard x5	20	2.5
	Barracks x12	12	0.6
Software	Evade/1	—	1
	Fire Control/4	—	4
	Jump Control/5	—	0.5
	Library	—	—
	Manoeuvre	—	—
Common Areas		11	1.1
Cargo		23.78	—
Total: MCr209.597			

Crew

Captain, Pilots x3, Astrogator, Engineer x4, Maintenance, Medic, Gunners x8, Officer

Hull: 160

Running Costs

MAINTENANCE COST

Cr15720/month

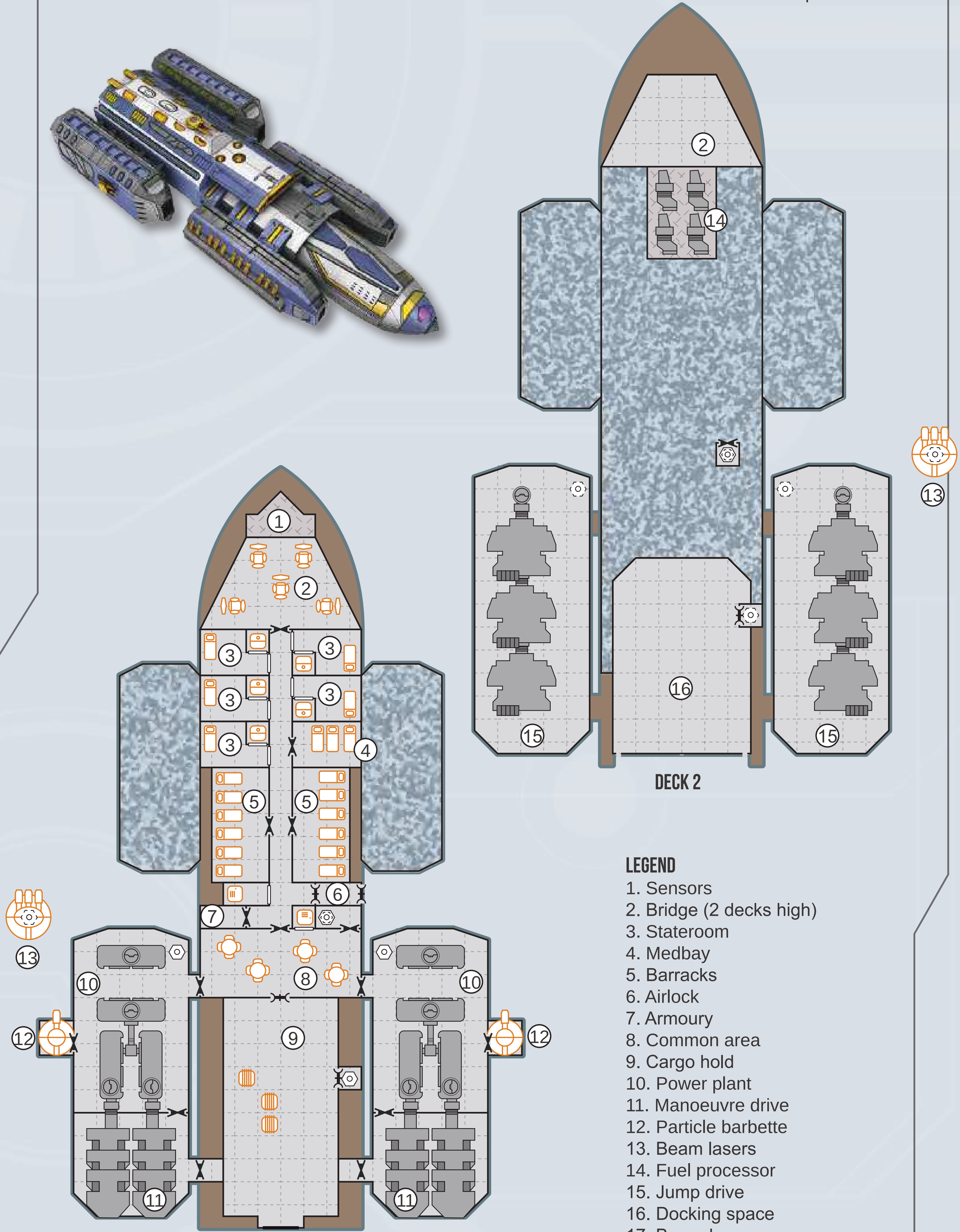
PURCHASE COST

MCr188.6373

Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	200
Jump Drive	260
Sensors	2
Fuel Processor	10
Weapons	56
Medical Bay	1

1 square = 0.5 Ton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DECK 1

LEGEND

1. Sensors
2. Bridge (2 decks high)
3. Stateroom
4. Medbay
5. Barracks
6. Airlock
7. Armoury
8. Common area
9. Cargo hold
10. Power plant
11. Manoeuvre drive
12. Particle barbette
13. Beam lasers
14. Fuel processor
15. Jump drive
16. Docking space
17. Barracks

FLEET COURIER

With communications limited to the speed of jump, the most difficult operational problem confronting fleet commanders is the transmission and receipt of timely intelligence reports and command directives. The fleet courier is intended to provide naval commanders with the capability of transmitting orders and information across subsector distances in relatively short periods of time. Early versions of this ship were fitted with jump-6 drives. This model abandons the jump-6 of its predecessor in order to make better time jump after jump, as the prior version required excessive refuelling and refining time. With Thrust 5 and greatly increased fuel processing, this model can usually conduct turnaround in three days or less if fuel skimming is required.

The Fleet Courier is equipped with purely defensive weaponry, designed to encourage its captains to flee combat and get its information payload where it is intended. The ship has an extra stateroom for occasions when it carries an important passenger, such as a courier or official.

TL15		Tons	Cost (MCr)
Hull	400 tons, Streamlined	—	20
M-Drive	Thrust 5 (energy efficient x3)	20	60
J-Drive	Jump 5 (reduced fuel)	55	90.75
Power Plant	Fusion (TL15), Power 380	19	38
Fuel Tanks	J-6, 4 weeks of operation	230	—
Bridge	Smaller Bridge	10	2
Computer	Computer/30	—	20
Sensors	Advanced	5	5.3
Weapons	Triple Turrets (beam lasers) x2	2	5
	Triple Turret (sandcasters) x2	2	3.5
Ammunition	Sandcaster Canister Storage (40 Canisters)	2	0.05
Systems	Fuel Processor (240 tons/day)	12	0.6
Staterooms	Standard x8	32	4
Software	Intellect	—	—
	Evade/3	—	3
	Fire Control/4	—	8
	Jump Control/5	—	0.6
	Anti-Hijack/3	—	10
	Manoeuvre	—	—
	Library	—	—
Common Areas		6	0.6
Cargo		5	—
Total: MCr274.25			

Crew

Captain, Pilots x2, Engineers x2, Maintenance, Gunners x2

Hull: 160

Running Costs

MAINTENANCE COST

Cr20569/month

PURCHASE COST

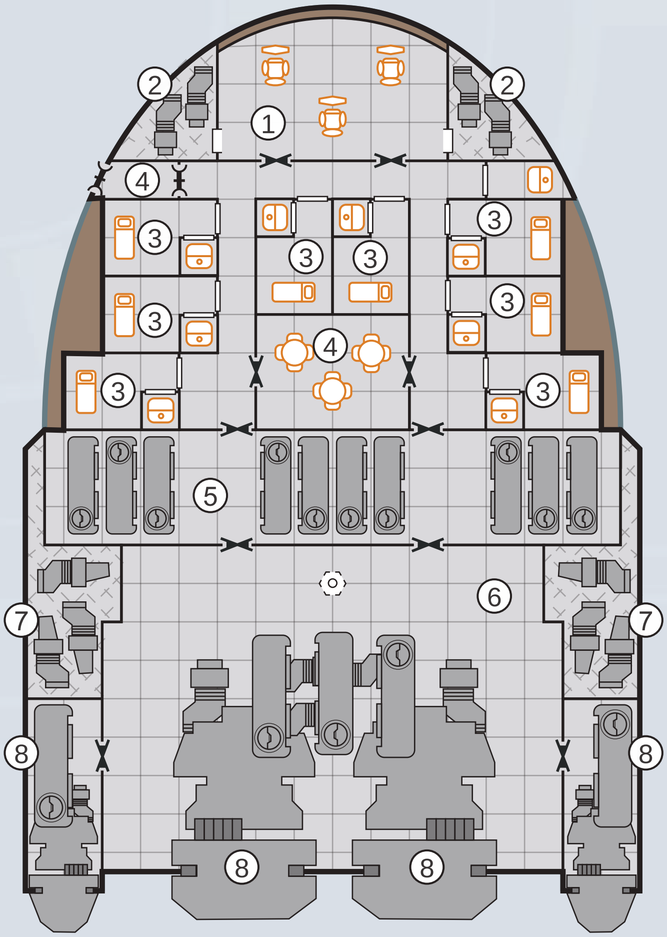
MCr246.825

Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	50
Jump Drive	200
Sensors	6
Weapons	28
Fuel Processor	56

FLEET COURIER

1 square = 0.5 Ton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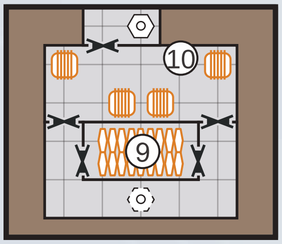
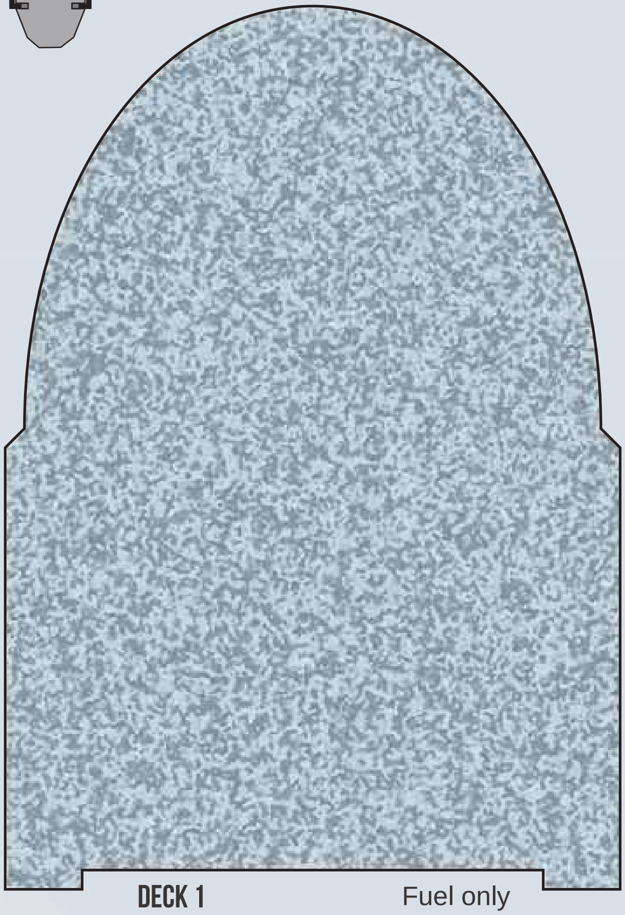


DECK 3



DECK 1

Fuel only

LEGEND

1. Bridge
2. Sensors
3. Stateroom
4. Common area
5. Power plant
6. Jump drive
7. Fuel processor
8. Manoeuvre drive
9. Sandcaster barrels
10. Cargo hold

LABORATORY SHIP

TYPE: L

A highly specialised vessel, the laboratory ship is built to transport scientists and their equipment across the stars in order to conduct research, usually in remote locations. The ship itself is fitted with highly advanced sensors, while a pinnace can carry an ATV down to a planet's surface in order to conduct field expeditions. A special feature of this ship is that it is built so internal gravity can be created by spinning the hull. This is done to permit experiments to be carried out that might otherwise be affected by the gravitic plates installed as standard on all ships.

The Laboratory Ship's Research Pinnace is a standard Pinnace, modified by replacing the cargo hold with a 19-ton Fuel/Cargo Container (consuming 19.95 tons) and a 1-ton Fuel Processor, to allow for wilderness refueling or transporting the ship's ATV.

TL12		Tons	Cost (MCr)
Hull	'360 tons, Dispersed Structure	—	9
M-Drive	'Thrust 2 (400t)	8	16
J-Drive	Jump 2 (400t)	25	37.5
Power Plant	Fusion (TL12), Power 180	12	12
Fuel Tanks	J-2 (400t), 4 weeks of operation	82	—
Bridge		20	2
Computer	Computer/10	—	0.16
Sensors	Improved	3	4.3
Systems	Advanced Probe Drones x15	3	2.25
	Laboratories	80	20
Craft	Air/raft	—	0.25
	Docking Clamp (Type II)	5	1
	Docking Space (4 tons)	5	1.25
	ATV (on pinnace)	—	0.155
	Research Pinnace (docking clamp)	0	9.825
Staterooms	Standard x20	80	10
Software	Jump Control/2	—	0.2
	Library	—	—
	Manoeuvre/0	—	—
	Intellect	—	—
Common Areas		15	1.5
Cargo		22	—
Total: MCr127.54			

Crew

Pilot, Astrogator

Hull: 160

Running Costs

MAINTENANCE COST

Cr9566/month

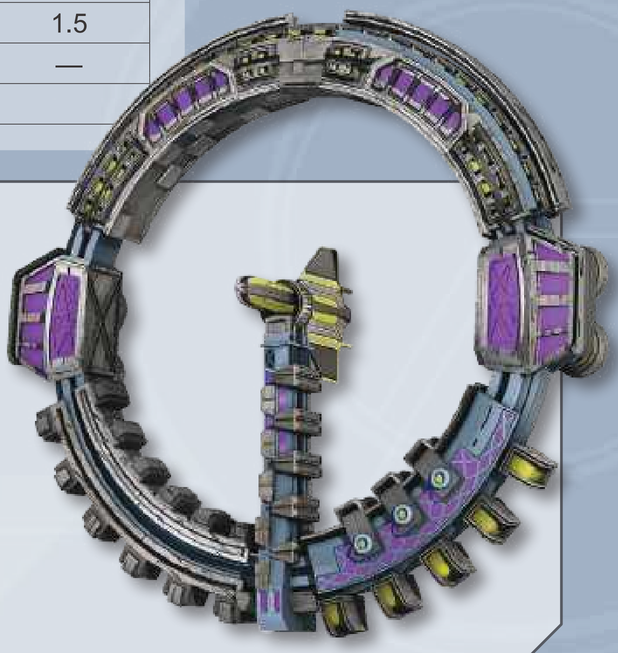
PURCHASE COST

MCr114.786

Power Requirements

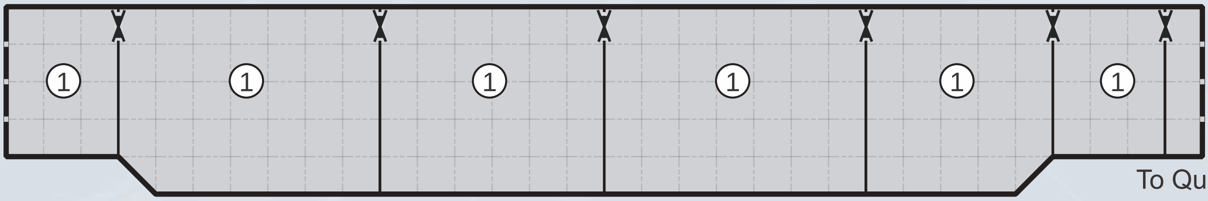
Basic Ship Systems	72
Manoeuvre Drive	80
Jump Drive	80
Sensors	4

TYPE L LABORATORY SHIP



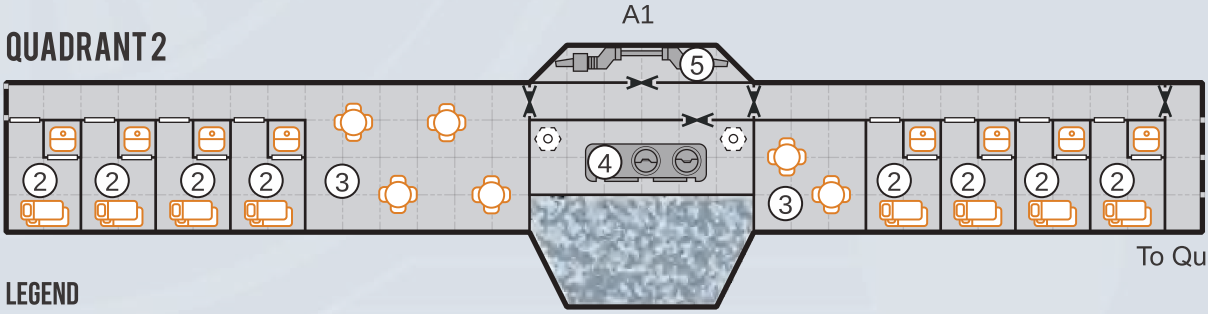
1 square = 0.5 Ton

QUADRANT 1



To Quadrant 4

QUADRANT 2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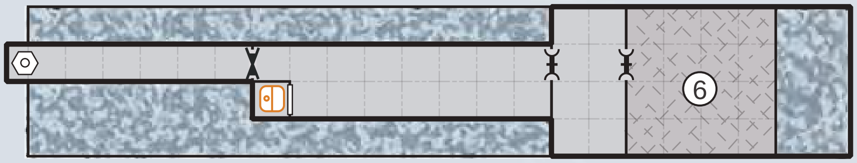
To Quadrant 1

LEGEND

1. Laboratories
2. Stateroom
3. Common area
4. Power plant
5. Sensors
6. Docking berth

DOCKING RING



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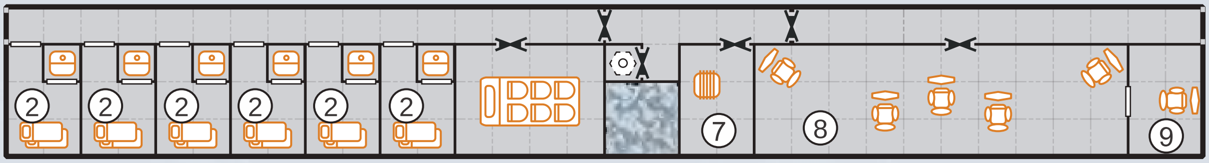

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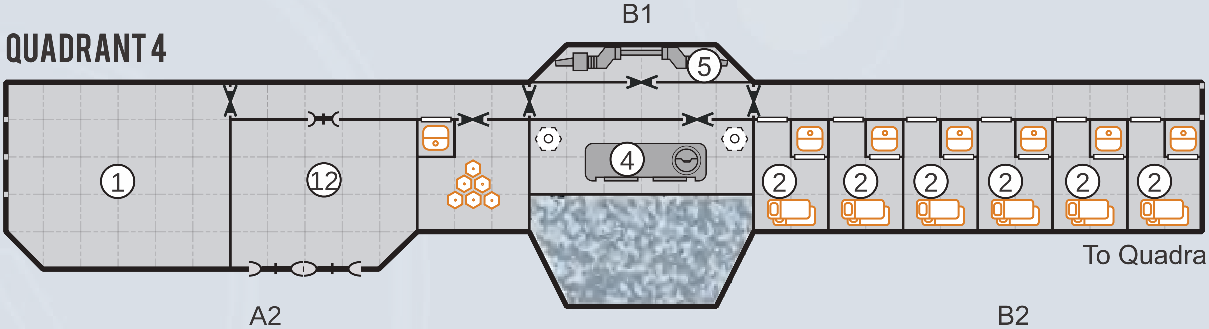
QUADRANT 4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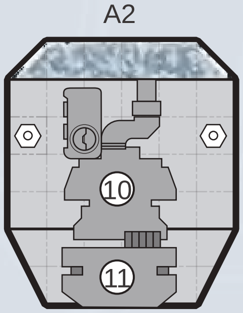
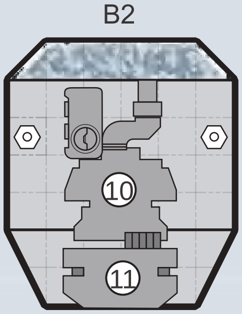




7. Cargo hold
8. Bridge
9. Office
10. Jump drive
11. Manoeuvre drive
12. Docking space

PATROL CORVETTE

TYPE: T

The patrol corvette is used by military organisations as a cheap but effective vessel for customs patrols, anti-piracy work and system defence. Despite being only a 400-ton hull, this corvette remains more than a match for typical pirate vessels of a similar size. The auxiliary ship's boat and G/carrier on board, combined with a streamlined hull, allow the patrol corvette to pursue targets through atmospheres and down onto planetary surfaces, ensuring there is no escape.

TL12		Tons	Cost (MCr)
Hull	400 tons, Streamlined	—	24
Armour	Crystaliron, Armour: 4	24	4.8
M-Drive	Thrust 4	16	32
J-Drive	Jump 3	35	52.5
Power Plant	Fusion (TL12), Power 300	20	20
Fuel Tanks	J-3, 4 weeks of operation	122	—
Bridge		20	2
Computer	Computer/15	—	2
Sensors	Military Grade	2	4.1
Weapons	Triple Turrets (pulse lasers) x2	2	8
	Triple Turrets (missile racks) x2	2	6.5
Craft	Docking Space (30 tons)	33	8.25
	Ship's Boat	—	7.58
	Docking Space (15 tons)	17	4.25
	G/carrier	—	11.58
Systems	Fuel Processor (80 tons/day)	4	0.2
	Fuel Scoops	—	—
Staterooms	Standard x12	48	6
	Low Berths x4	2	0.2
Software	Manoeuvre	—	—
	Jump Control/3	—	0.3
	Library	—	—
	Intellect	—	—
	Evade/1	—	1
	Fire Control/1	—	2
Common Areas		10	1
Cargo		43	—
Total: MCr198.26			

Crew

Pilot, Astrogator, Engineers x2, Medic, Gunners x4, Marines x8

Hull: 160

Running Costs

MAINTENANCE COST

Cr14870/month

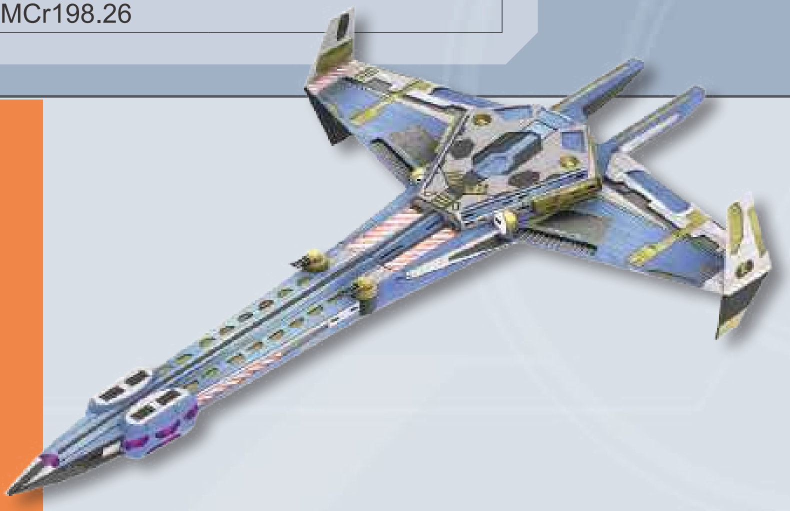
PURCHASE COST

MCr178.434

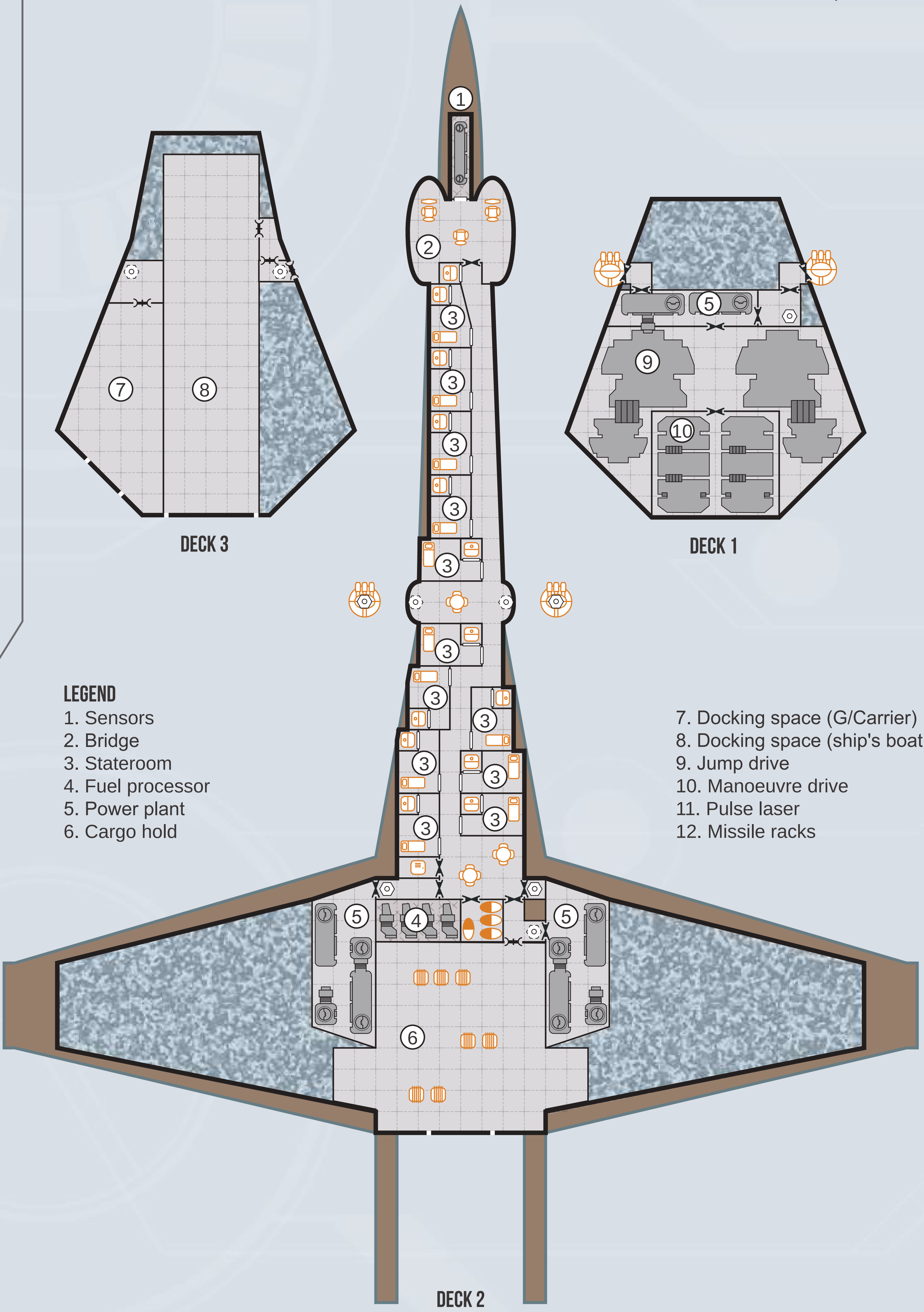
Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	160
Jump Drive	120
Sensors	2
Weapons	28
Fuel Processor	4

TYPE T PATROL CORVETTE



1 square = 0.5 Ton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DECK 3
DECK 1
DECK 2

LEGEND

1. Sensors
2. Bridge
3. Stateroom
4. Fuel processor
5. Power plant
6. Cargo hold
7. Docking space (G/Carrier)
8. Docking space (ship's boat)
9. Jump drive
10. Manoeuvre drive
11. Pulse laser
12. Missile racks

SUBSIDISED MERCHANT

TYPE: R

The subsidised merchant (also called the fat trader) is a trading vessel intended to meet the commercial needs of clusters of worlds. It is twice the size of a free trader but carries cargo far more efficiently with a cavernous cargo bay more than twice the size of that within its little cousin. In fact, if its cargo bay doors were larger, the subsidised merchant could theoretically swallow a free trader whole. This ship normally requires a crew of five, although the pilot also operates the launch, a steward is only necessary if carrying commercial passengers and gunners may be added to the list if weapons are installed.

TL12		Tons	Cost (MCr)
Hull	400 tons, Streamlined	—	24
M-Drive	Thrust 1	4	8
J-Drive	Jump 1	15	22.5
Power Plant	Fusion (TL12), Power 135	9	9
Fuel Tanks	J-1, 4 weeks operation	41	—
Bridge		20	2
Computer	Computer /5	—	0.03
Sensors	Civilian Grade	1	3
Weapons	—	—	—
Craft	Docking Space (20 tons)	22	5.5
	Launch	—	2.63
Systems	Fuel Scoop	—	—
	Fuel Processors (20 tons/day)	1	0.05
Staterooms	Standard x19	76	9.5
	Low Berths x9	4.5	0.45
Software	Jump Control/1	—	0.1
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		5.5	0.55
Cargo		201	—
Total: MCr87.31			

Crew

Pilot, Astrogator, Engineer, Medic, Steward

Hull: 160

Running Costs

MAINTENANCE COST

Cr6549/month

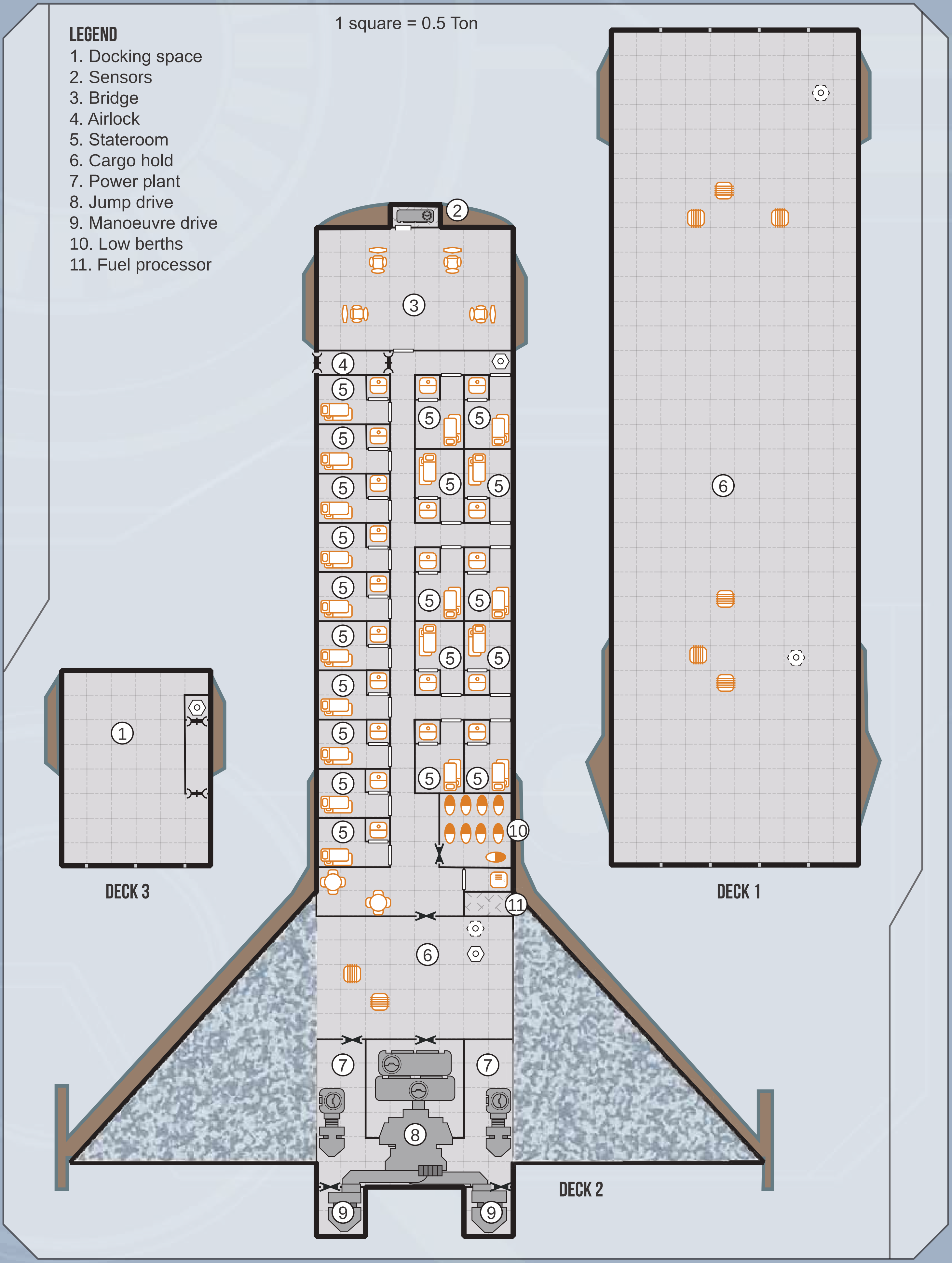
PURCHASE COST

MCr78.579

Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	40
Jump Drive	40
Sensors	1

TYPE R SUBSIDISED MERCHANT


1 square = 0.5 Ton
LEGEND
1. Docking space
2. Sensors
3. Bridge
4. Airlock
5. Stateroom
6. Cargo hold
7. Power plant
8. Jump drive
9. Manoeuvre drive
10. Low berths
11. Fuel processor
DECK 3
DECK 1
DECK 2

SURVEY SCOUT

CLASS: DONOSEV

The survey scout is a typical ship in service with the Imperial Interstellar Scout Service. Its function is to continually re-survey the interior regions of the Imperium, updating maps and charts, and maintaining beacons and markers for astrogation hazards.

The survey scout is a peaceful vessel, typically unarmed and inoffensive. It does, however, mount four hardpoints and can be armed with a variety of turrets and weaponry if necessary. The *Donosev*-class is named for famous scouts in the Imperial service. It often carries a Fuel Skimmer module for its Cutter to allow wilderness refueling.

TL14		Tons	Cost (MCr)
Hull	400 tons, Dispersed Structure	—	10
M-Drive	Thrust 3	12	24
J-Drive	Jump-3 (reduced size x2)	28	65.625
Power Plant	Fusion (TL12), Power 210	14	14
Fuel Tanks	J-3, 8 weeks of operation	124	—
Bridge	Standard	20	2
	Sensor Station	1	0.5
Computer	Computer/25	—	10
Sensors	Improved	3	4.3
Craft	Docking Space (50 tons)	55	13.75
	Modular Cutter	—	11.93
	Docking Space (30 tons)	33	8.25
	Module	—	—
	Docking Space (4 tons) x3	15	3.75
	Air/Raft x3	—	0.75
Systems	Fuel Processor (120 tons/day)	6	0.3
	Advanced Probe Drones x20	4	3.2
	Laboratories x2	8	2
	Workshop	6	0.9
Staterooms	Standard x10	40	5
Software	Manoeuvre	—	—
	Intellect	—	—
	Library	—	—
	Jump Control/3	—	0.3
Common Areas		10	1
Cargo		21	—
Total: MCr181.555			

Crew

Pilot, Astrogator, Engineers x2, Medic, Scientists x5

Hull: 144

Running Costs

MAINTENANCE COST

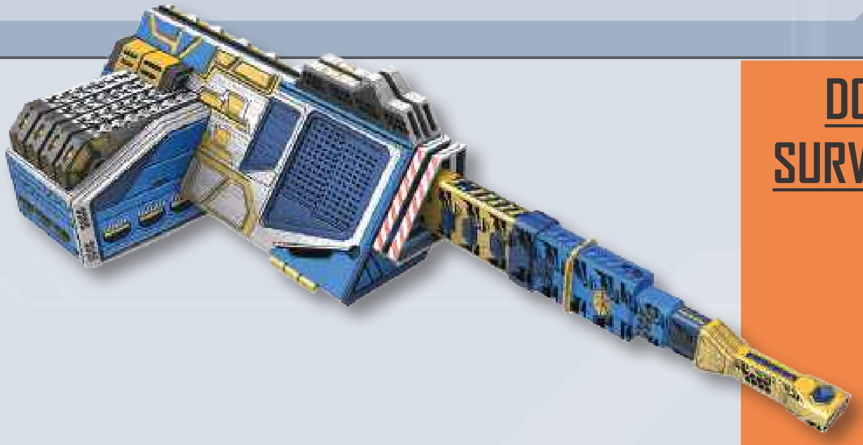
Cr13617/month

PURCHASE COST

MCr163.3995

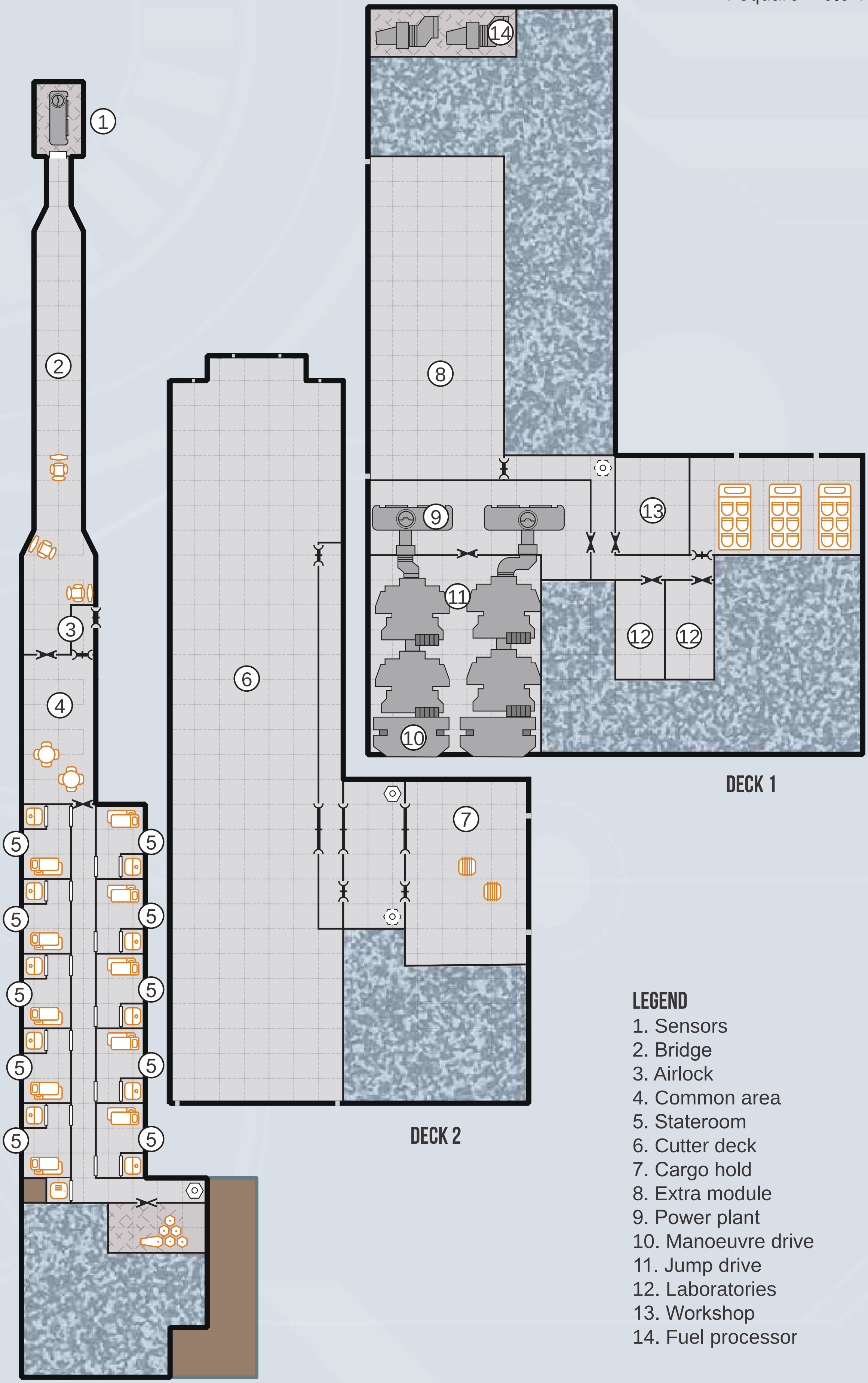
Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	80
Jump Drive	120
Sensors	4
Fuel Processor	6



DONOSEV SURVEY SCOUT

1 square = 0.5 Ton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DECK 2
DECK 3

LEGEND

1. Sensors
2. Bridge
3. Airlock
4. Common area
5. Stateroom
6. Cutter deck
7. Cargo hold
8. Extra module
9. Power plant
10. Manoeuvre drive
11. Jump drive
12. Laboratories
13. Workshop
14. Fuel processor

SYSTEM DEFENCE BOAT

CLASS: DRAGON

TL13		Tons	Cost (MCr)
Hull	400 tons, Streamlined	—	24
	Reinforced	—	12
	Stealth (Improved)	—	40
Armour	Crystaliron, Armour: 13	78	15.6
	Radiation Shielding	—	10
M-Drive	Thrust 7	28	56
Power Plant	Fusion (TL12), Power 450	30	30
Fuel Tanks	16 weeks of operation	12	—
Bridge	Holographic Controls	20	2.5
	Sensor Stations x2	2	1
Computer	Computer/25fib	—	15
	Backup: Computer/20fib	—	7.5
Sensors	Improved	3	4.3
	Countermeasures Suite	2	4
	Extended Arrays	6	8.6
	Enhanced Signal Processing	2	8
Weapons	Particle Barbettes x2	10	16
	Small Missile Bay (size reduction x3)	35	18
	Point Defence Laser Battery (Type II)	20	10
Ammunition	Missile Storage (480 missiles)	40	—
Armoured Bulkheads	Manoeuvre Drive	2.8	0.56
	Power Plant	3.0	0.6
	Fuel	1.2	0.24
	Bridge	2.2	0.44
	Sensors	1.3	0.26
	Weapons	6.5	1.3
	Missile Storage	4	0.8
Systems	Fuel Scoops	—	—
	Repair Drones	4	0.8
	Armoury	1	0.25
	Biosphere	4	0.8
	Medical Bay	4	2
	Training Facilities	4	0.8
	Workshop	6	0.9
Staterooms	Standard x10	40	5
Software	Auto-Repair/1	—	5
	Evade/1	—	1
	Fire Control/2	—	4
	Intellect	—	—
	Library	—	—
	Manoeuvre	—	—
Common Areas		10	1
Cargo		18	—
Total: MCr308.25			

Crew

Captain, Pilots x3, Astrogator, Engineers x2, Maintenance, Medic, Gunners x6, Sensops x3, Officer

Hull: 176

Running Costs

MAINTENANCE COST

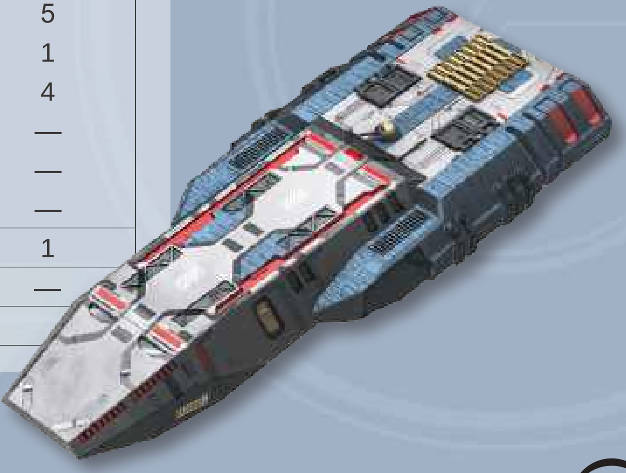
Cr23119/month

PURCHASE COST

MCr277.425

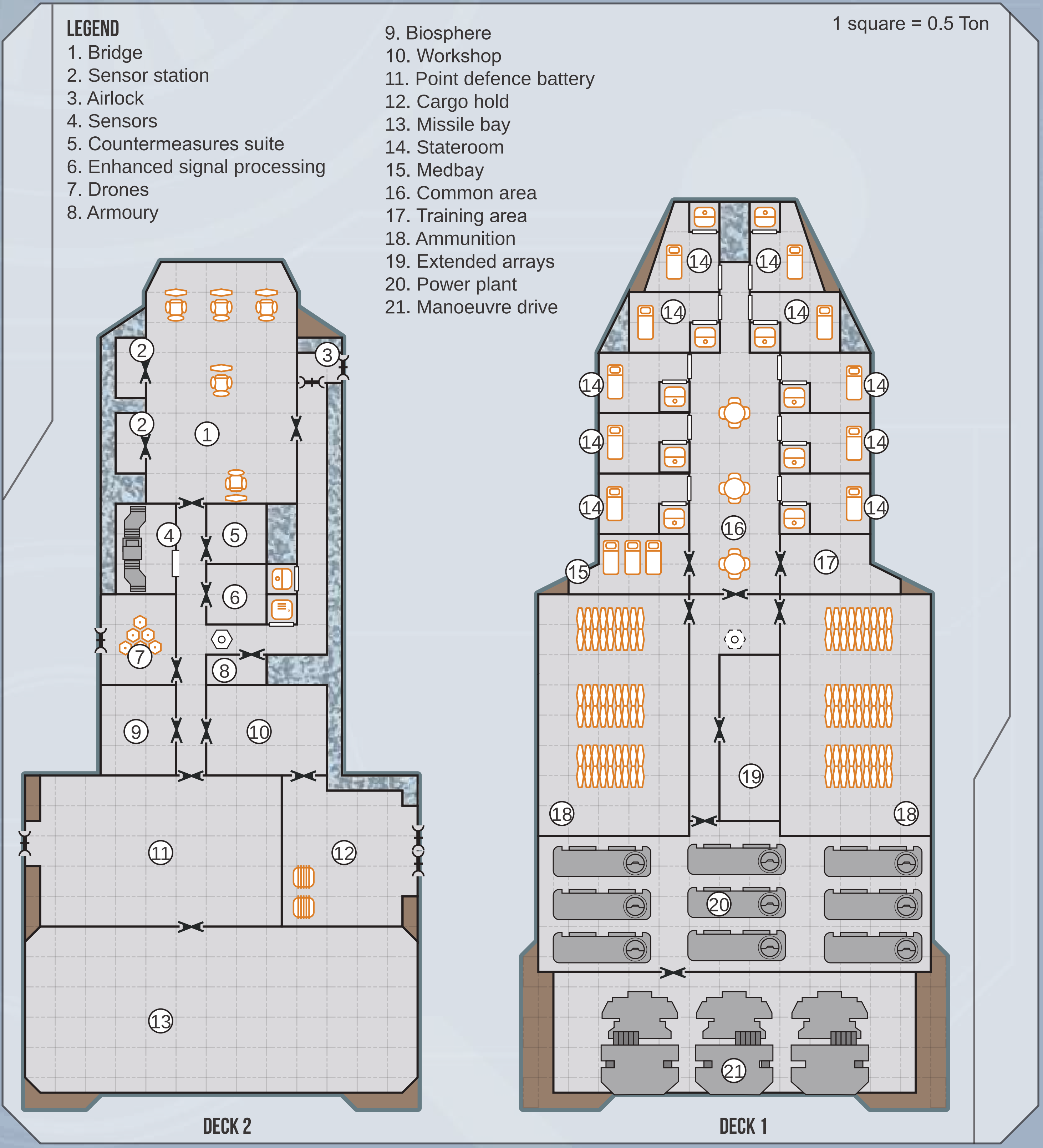
Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	280
Sensors	15
Weapons	55
Biosphere	4
Medical Bay	1



The term boat means a non-starship, whether a gunboat, a ship's boat or a system defence boat. Because non-starships can allocate more tonnage to power plants and weaponry, they can usually defeat a starship of equal tonnage. From this principle, the concept of the system defence boat has evolved. Fleets of such boats are stationed in important systems and charged with their defence. From stations in orbit, they defend the primary world. From stations deep within the local gas giant, they attack enemy ships in the process of refuelling. In extreme situations, they can scatter and hide, in asteroid belts, on airless worlds and in the depths of oceans; later they strike out again, hitting the enemy from the rear or when least expected.

Finally, such system defence boats are also used for routine duties such as customs inspections, piracy suppression and search and rescue.



LEGEND

1. Bridge
2. Sensor station
3. Airlock
4. Sensors
5. Countermeasures suite
6. Enhanced signal processing
7. Drones
8. Armoury
9. Biosphere
10. Workshop
11. Point defence battery
12. Cargo hold
13. Missile bay
14. Stateroom
15. Medbay
16. Common area
17. Training area
18. Ammunition
19. Extended arrays
20. Power plant
21. Manoeuvre drive

1 square = 0.5 Ton

CORSAIR

TYPE: P (NISHEMANI CLASS)

A tool of corsairs and pirates throughout the Third Imperium and beyond, the *Nishemani* is infamous for devouring 100 ton ships whole and delivering them to criminal starports for refurbishing into ships that cannot be identified as the originals. This is among the grandest (as measured in Megacredits) sustained theft operations in modern times. All major polities have issued destroy-on-identification orders for this ship class, making it a small wonder that there exist enough ships to make a class. The *Nishemani* counters this by being able to transform and disguise itself as a wide variety of innocent 400-ton classes, primarily traders.

Its cargo bay and docking space are combined, with cargo secured when it comes time to open the bay wide and take in a ship. Docking operations are only rated for taking in ships up to 100 tons.

Theories abound as to who designed and distributed the blueprints for this class but whoever did it was clearly going for a purpose-built pirate ship. The manoeuvre drives are just strong enough to overtake most unarmed merchant ships. The turrets, despite being built to handle triple weapons, come with single weapons and extra space. The rated crew positions list 'thugs' where any decent ship would list 'marines'. The low berths, while of acceptable grade, are laid out to rack and stow unfortunate crew and passengers of the victim ships, whether to ransom or sell them as slaves, although their value is almost always secondary to that of the stolen ship. Even after fencing a stolen ship, paying off sponsors and so on, a *Nishemani's* 10 crew can each look forward to receiving a significant fraction of a Megacredit for each successful raid. This has spurred enough pirate activity that many suspect the true purpose of this design is to destabilise the Third Imperium's lifeblood of trade.

At one point it was feared there were almost a million of this ship in Imperial space, enough to gain the Type-P moniker. Subsequent studies suggest that there are merely hundreds (despite eradication efforts), which is still more than uncoordinated individual efforts should have been able to produce. So far as can be told, no single yard makes enough of these to take advantage of mass production efficiencies.

Crew

Pilot, Astrogator, Engineers, Gunners x3, Thugs x4

Hull: 160

Running Costs

MAINTENANCE COST

Cr15072/month

PURCHASE COST

MCr180.86

Power Requirements

Basic Ship Systems	80
Manoeuvre Drive	120
Jump Drive	80
Sensors	6
Low Berths	2
Weapons	15
Fuel Processor	4

CORSAIR

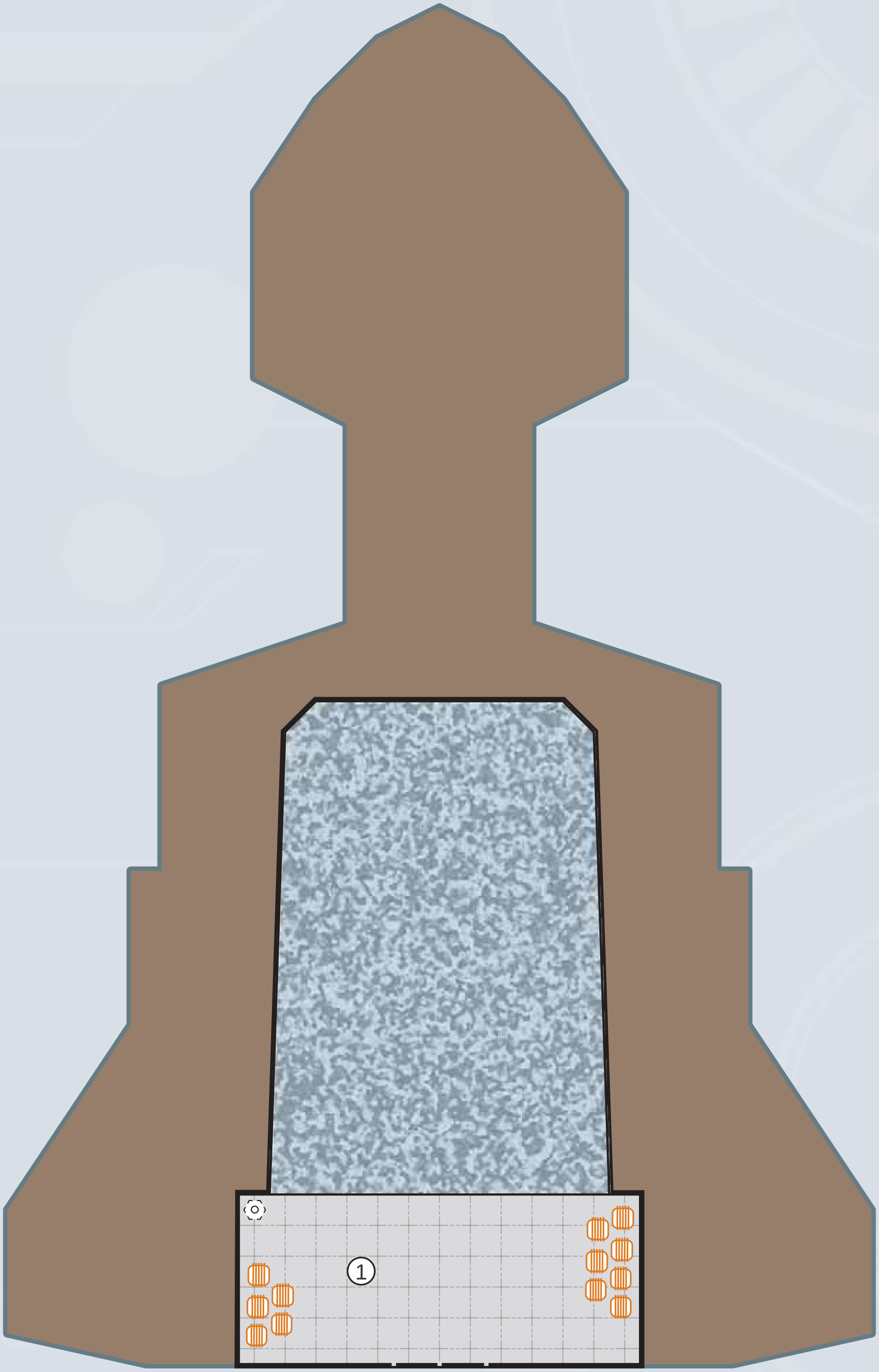
TYPE: P (NISHEMANI CLASS)

TL15		Tons	Cost (MCr)
Hull	400 tons, Standard	—	20
Armour	Bonded Superdense, Armour: 5	16	8
M-Drive	Thrust 3	12	24
J-Drive	Jump 2	25	37.5
Power Plant	Fusion (TL15), Power 230	11.5	23
Fuel Tanks	J-2, 4 weeks of operation	82	—
Bridge		20	2
Computer	Computer/10	—	0.16
Sensors	Advanced	5	5.3
Weapons	Triple Turrets (beam laser x1) x3	3	4.5
Systems	Adjustable Hull (TL15)	4	20
	Fuel Processor (80 tons/day)	4	0.2
	Fuel Scoops	—	1
	'Forced Linkage Apparatus (Advanced)	2	0.5
	Low Berth x 20	10	1
	Docking Space (100 tons)	110	27.5
Staterooms	Standard x10	40	5
	Low Berths x20	10	1
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
Common Areas		10	1
Cargo		45.5	—
Total: MCr180.86			

NISHEMANI
CORSAIR

LEGEND
1. Cargo hold

1 square = 0.5 Ton

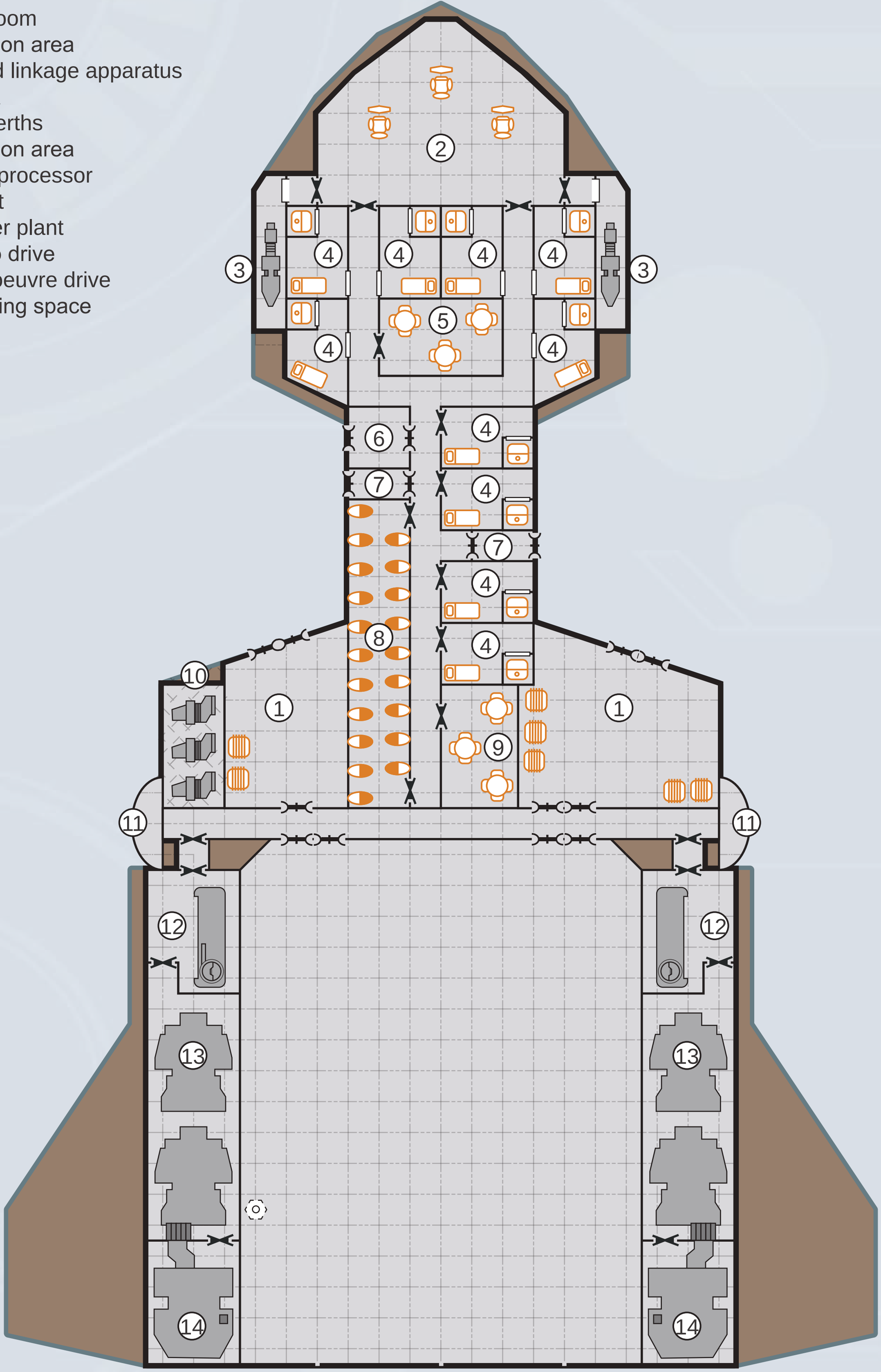


DECK 1

LEGEND

1. Cargo hold
2. Bridge
3. Sensors
4. Stateroom
5. Common area
6. Forced linkage apparatus
7. Airlock
8. Low berths
9. Common area
10. Fuel processor
11. Turret
12. Power plant
13. Jump drive
14. Manoeuvre drive
15. Docking space

1 square = 0.5 Ton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DECK 2

SUBSIDISED LINER

TYPE: M

The subsidised liner is built for carrying passengers and cargo along lucrative routes, with amenities providing an elevated level of comfort and luxury. The high number of stewards includes cooks and entertainers, as well as shop, salon and gym staff. Overall, the ship is capable of carrying 24 passengers in addition to its crew, with a further 20 in low berths.

The three-parsec jump capability commands higher passenger and freight fees, and allows less desirable ports to be bypassed. Although the hull of the ship itself is only partially streamlined, a launch allows passengers to be ferried to the surface of a world or act as a lifeboat in emergencies.

TL12		Tons	Cost (MCr)
Hull	600 tons, Standard	—	30
M-Drive	Thrust 1	6	12
J-Drive	Jump 3	50	75
Power Plant	Fusion (TL12), Power 360	24	24
Fuel Tanks	J-3, 4 weeks of operation	183	—
Bridge		20	3
Computer	Computer/10bis	—	0.24
Sensors	Civilian Grade	1	3
Weapons		—	—
Craft	Docking Space (20 tons)	22	5.5
	Launch	—	2.63
Systems	Biosphere	1	0.2
	Gourmet Kitchen (12 diners)	12	2.4
	Hot Tub (4 seats)	1	0.012
	Swimming Pool	8	0.16
	Theatre	8	1.6
	Wet Bar	—	0.002
	Medical Bay	4	2
	Studios x2 (shops, salons)	8	0.8
	Training Facilities (gym)	4	0.8
Staterooms	Standard x30	120	15
	High x4	24	3.2
	Low Berths	10	1
Software	Manoeuvre	—	—
	Library	—	—
	Intellect	—	—
	Jump Control/3	—	0.3
Common Areas		34	3.4
Cargo		60	—
Total: MCr186.244			

Crew

Captain, Pilots x2, Astrogator, Engineers x3, Maintenance, Medic, Stewards x10, Officer

Hull: 240

Running Costs

MAINTENANCE COST

Cr13968/month

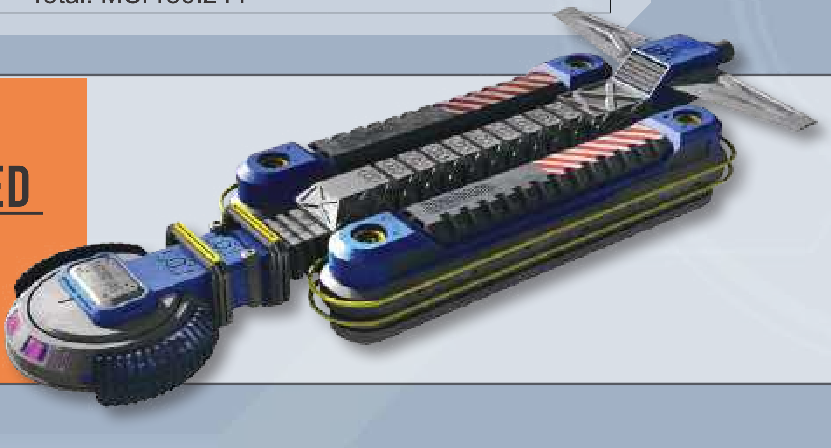
PURCHASE COST

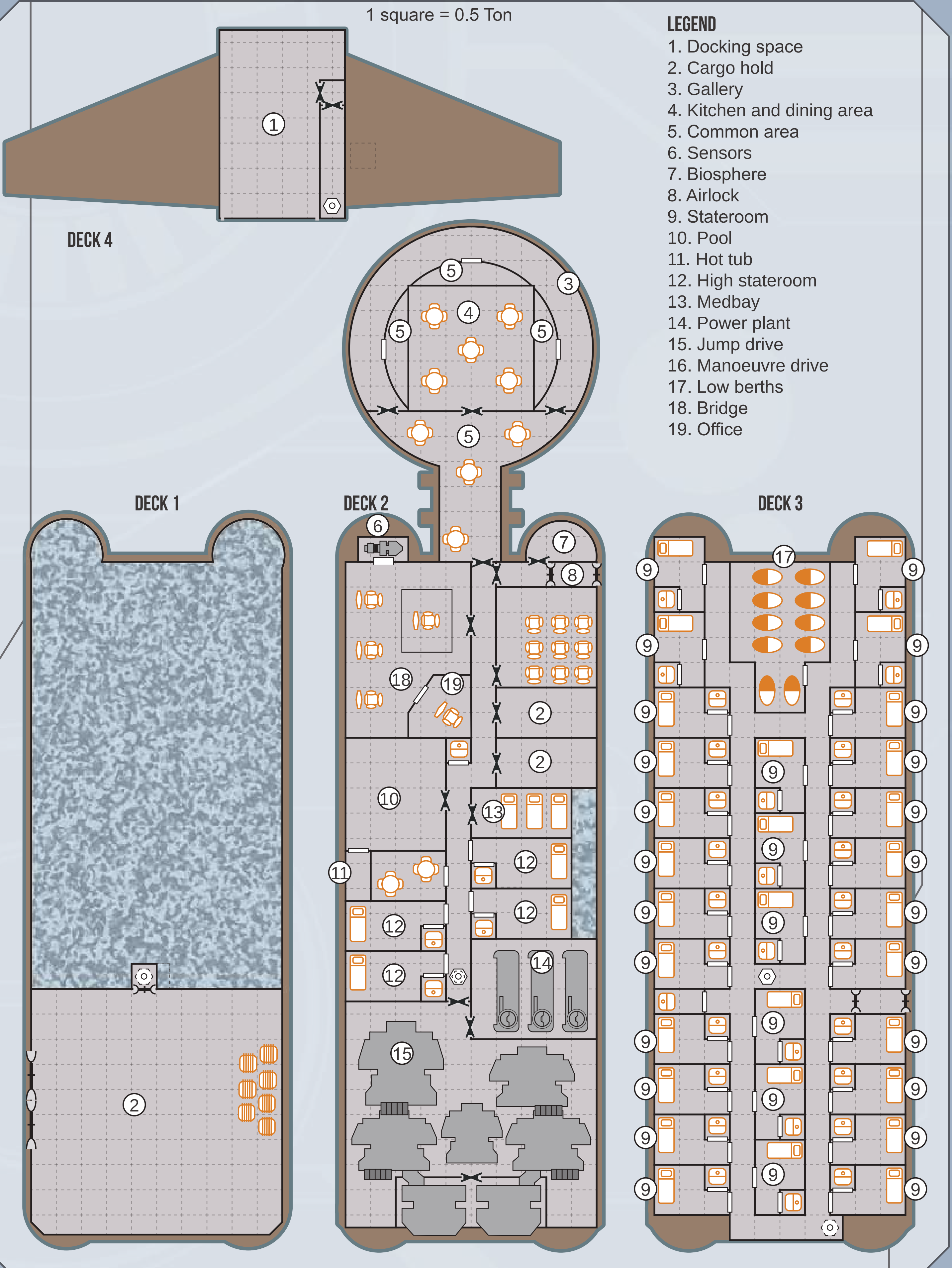
MCr167.6196

Power Requirements

Basic Ship Systems	120
Manoeuvre Drive	60
Jump Drive	180
Sensors	1
Biosphere	1
Medical Bay	1
Low Berths	2

TYPE M SUBSIDISED LINER




1 square = 0.5 Ton
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DECK 1
DECK 2
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LEGEND

1. Docking space
2. Cargo hold
3. Gallery
4. Kitchen and dining area
5. Common area
6. Sensors
7. Biosphere
8. Airlock
9. Stateroom
10. Pool
11. Hot tub
12. High stateroom
13. Medbay
14. Power plant
15. Jump drive
16. Manoeuvre drive
17. Low berths
18. Bridge
19. Office

MERCENARY CRUISER

TYPE: C

The mercenary cruiser is built to carry small troop units for corporate, governmental or, more commonly, mercenary operations. It has enough space to carry a combat platoon of 30, plus crew and support personnel, along with their equipment, albeit in fairly cramped confines. The platoon can be deployed to a planet's surface via the two modular cutters housed inside the ship. Two spare cutter modules can be carried in addition to those installed on the cutters, providing greater versatility in missions, although changing modules requires a delicate dance of launch, release, recovery and transfer of modules that can take up to an hour. Turrets are fitted as standard but neither weapons nor cutter modules are included, allowing maximum owner customisation, and it is a rare mercenary cruiser that is not armed to the teeth. A luxury stateroom is reserved for the ship's owner.

A common loadout for the cutters might be two Vehicle modules with AFVs, a Cargo module and a Fuel Skimmer module. A better-financed mercenary unit might instead have an Assault boat module, a Gunship module with a Lynx Fast Assault Tank, a Vehicle module with a Liberator G/Carrier and a Cargo module.

Crew

Captain, Pilots x3, Astrogator, Engineers x4, Mechanic, Medic, Stewards

Hull: 320

Running Costs

MAINTENANCE COST

Cr28913/month

PURCHASE COST

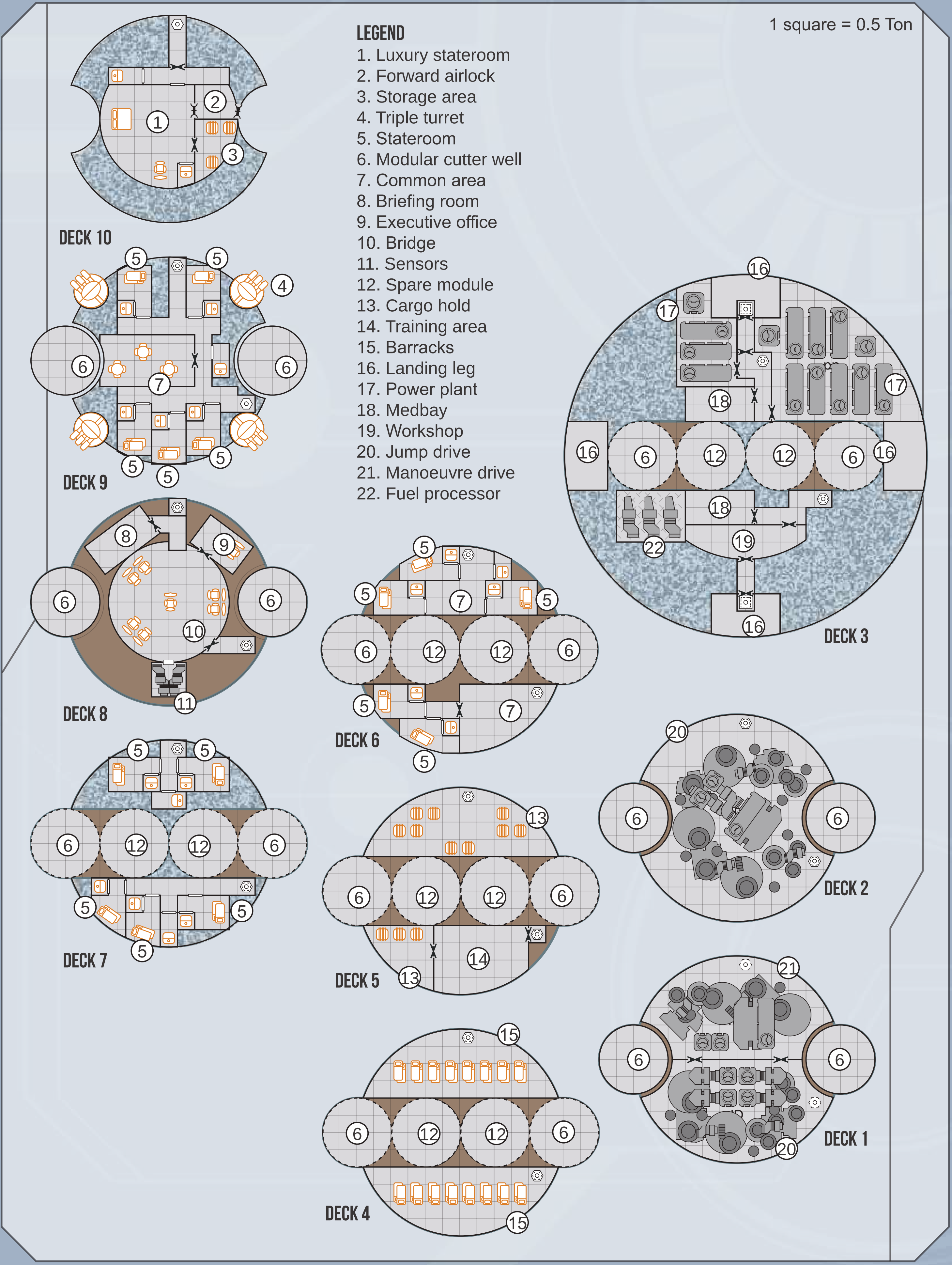
MCr346.959

Power Requirements

Basic Ship Systems	160
Manoeuvre Drive	120
Jump Drive	240
Sensors	2
Weapons	8
Fuel Processor	6
Medical Bay	2

MERCENARY CRUISER

TL12		Tons	Cost (MCr)
Hull	800 tons, Sphere	—	44
Armour	Crystaliron, Armour: 3	27	5.4
	Radiation Shielding	—	20
M-Drive	Thrust 3 (energy efficient x2)	24	60
J-Drive	Jump 3	65	97.5
Power Plant	Fusion (TL12), Power 540	36	36
Fuel Tanks	J-3, 8 weeks of operation, plus fuel for Cutters	250	—
Bridge	Holographic Controls	20	5
Computer	Computer/20fib	—	7.5
Sensors	Military Grade	2	4.1
Weapons	Triple Turret (empty) x8	8	8
Craft	Docking Spaces (50 tons) x2	110	27.5
	Modular Cutters x2	—	23.86
	Docking Spaces (30 tons) x2	66	16.5
	Extra Cutter Modules x2	—	—
	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Fuel Processor (120 tons/day)	6	0.3
	Fuel Scoops	—	1
	Armoury	7	1.75
	Briefing Room	4	0.5
	Medical Bays x2	8	4
	Training Facilities	10	2
	Workshop	6	0.9
Staterooms	Standard x15	60	7.5
	Luxury	10	1.5
	Barracks x30	30	1.5
Software	Manoeuvre	—	—
	Intellect	—	—
	Jump Control/3	—	0.3
	Library	—	—
	Evade/1	—	1
	Fire Control/2	—	4
Common Areas		24	2.4
Cargo		22	—
Total: MCr385.51			



1 square = 0.5 Ton

LEGEND

1. Luxury stateroom
2. Forward airlock
3. Storage area
4. Triple turret
5. Stateroom
6. Modular cutter well
7. Common area
8. Briefing room
9. Executive office
10. Bridge
11. Sensors
12. Spare module
13. Cargo hold
14. Training area
15. Barracks
16. Landing leg
17. Power plant
18. Medbay
19. Workshop
20. Jump drive
21. Manoeuvre drive
22. Fuel processor

DECK 10
DECK 9
DECK 8
DECK 7
DECK 6
DECK 5
DECK 4
DECK 3
DECK 2
DECK 1

X-BOAT TENDER

CLASS: XT

The Express Boat Network would not work without the express boat tender. These tenders, stationed in each system that express boats stop at, serve two purposes. First, they tend express boats, recovering them when they arrive, refuelling them and repairing minor problems, and then sending them on their way. Second, they serve as a relay station between the planetary surface-based message centre and the express boat itself. Messages are forwarded to the tender for transmittal to the x-boat just before it leaves for the next star system.

Express boat tenders are encountered anywhere that x-boats are expected. High-population, high-technology systems probably have several tenders operating in order to handle the flow of information. Express boat tenders are jump-capable and each may carry up to four x-boats in their cavernous ship bays. As a result, the tenders can be found in fringe or off-route systems ferrying extra x-boats to areas that need them. They also undertake recovery missions to pick up damaged x-boats or boats that have misjumped to off-route systems.

TL14		Tons	Cost (MCr)
Hull	1,000 tons, Standard	—	50
M-Drive	Thrust 1	10	20
J-Drive	Jump 1	30	45
Power Plant	Fusion (TL12), Power 450	30	30
Fuel Tanks	J-1, 20 weeks of operation	115	—
Bridge		20	5
Computer	Computer/15	—	2
Sensors	Civilian Grade	1	3
Weapons	Single Turrets (empty) x2	2	0.4
	Pop-Up Single Turret (empty)	2	1.2
Craft	Docking Space (300 tons)	330	82.5
	Full Hangar (100 tons)	200	40
Systems	Spare Parts and Equipment	60	6
	Fuel Processor (100 tons/day)	5	0.25
	Fuel Scoops	—	1
	Mail Distribution Array (Advanced)	20	10
	Workshops x2	12	1.8
	Medical Bay with AutoDoc	4	3
	UNREP (40 tons/hour)	2	1
Staterooms	Standard x10	40	5
	Low Berths x20	10	1
	High	6	0.8
Software	Intellect	—	—
	Jump Control/1	—	0.1
	Manoeuvre	—	—
	Library	—	—
Common Areas		23	2.3
Cargo		78	—
Total: MCr311.35			

Crew

Captain Pilot, Astrogator, Engineers x2, Maintenance, Medic

Hull: 400

Running Costs

MAINTENANCE COST

Cr23351/month

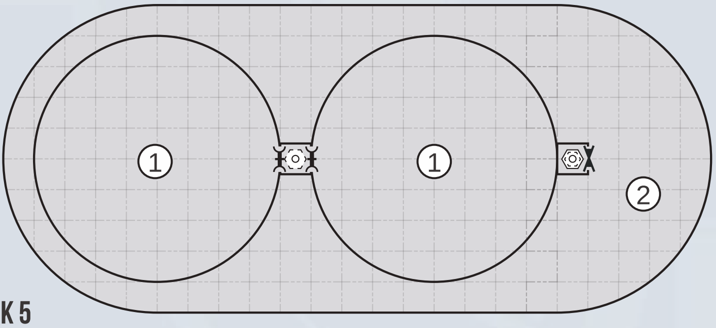
PURCHASE COST

MCr280.215

Power Requirements

Basic Ship Systems	200
Manoeuvre Drive	100
Jump Drive	100
Sensors	1
Weapons	3
Fuel Processor	5
Low Berths	2
UNREP	2

1 square = 0.5 Ton



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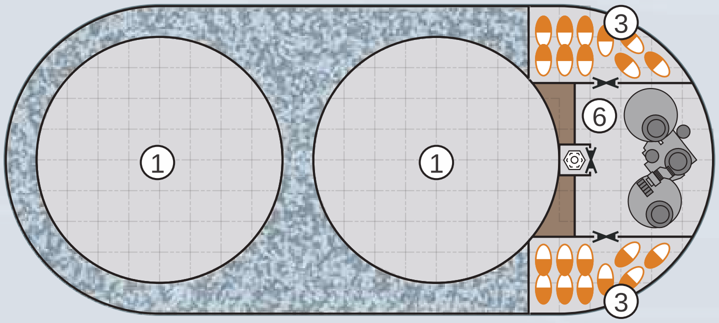
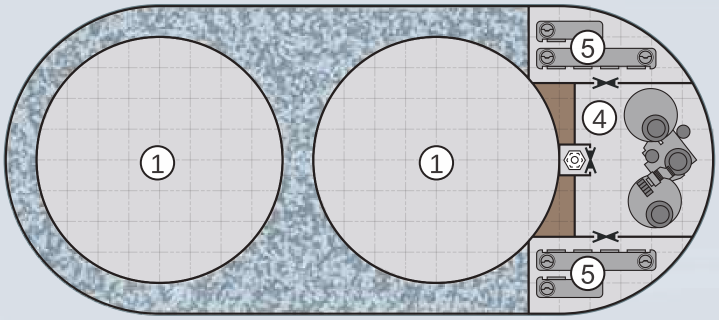


DECK 4

LEGEND

1. Docking space
2. Spare parts and equipment
3. Low berths
4. Manoeuvre drive
5. Power plant
6. Jump drive



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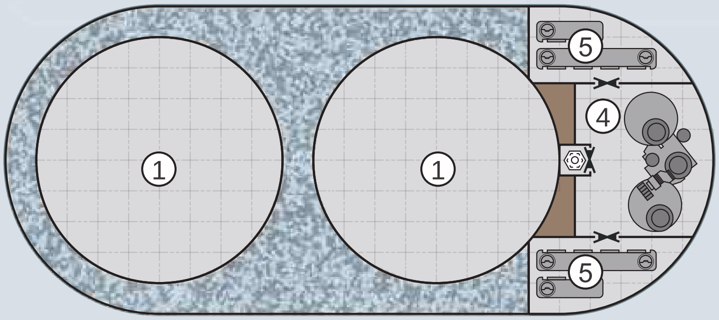

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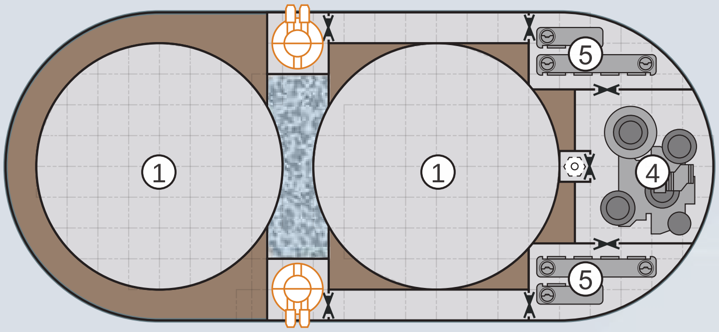
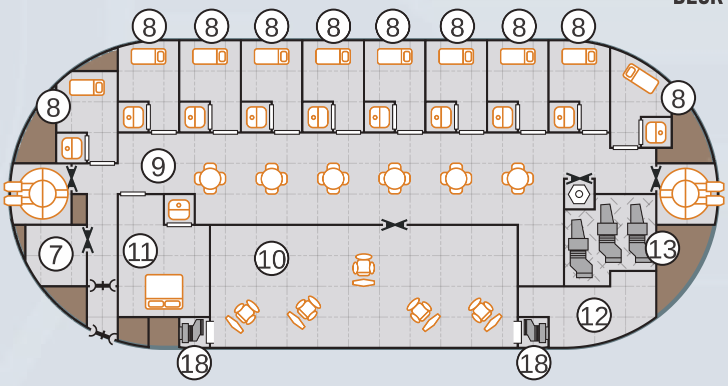


DECK 1

1 square = 0.5 Ton

LEGEND

1. Docking space
2. Spare parts and equipment
3. Low berths
4. Manoeuvre drive
5. Power plant
6. Jump drive
7. UNREP system
8. Stateroom
9. Common area
10. Bridge
11. High stateroom
12. Medbay
13. Fuel processor
14. Hangar
15. Workshop
16. Cargo hold
17. Mail distribution array
18. Sensors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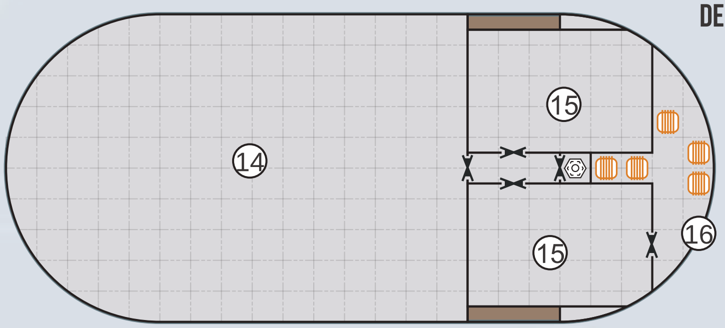
DECK 10



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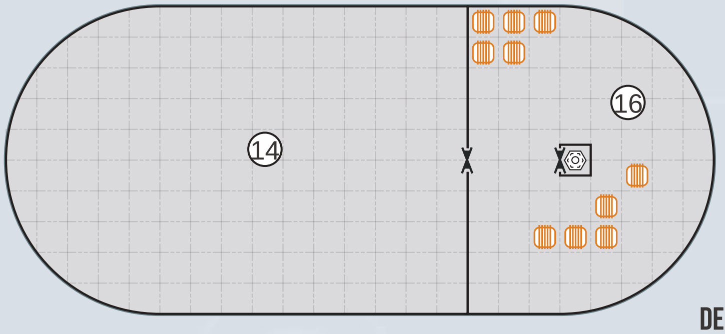

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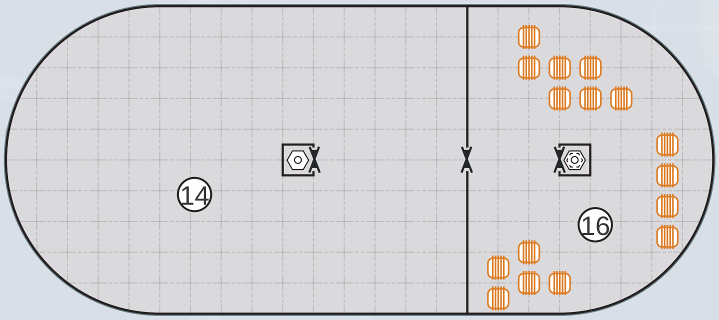

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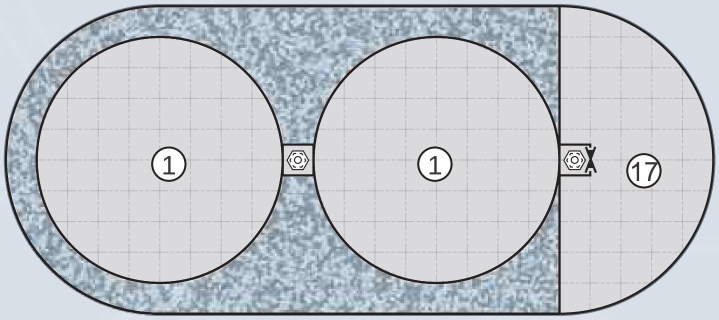


DECK 6

DESTROYER ESCORT

CLASS: CHRYSANTHEMUM

The *Chrysanthemum* destroyer escort is a small, fast vessel intended for fleet and squadron escort duties. The design is old, but efficient, with examples of the ship serving in the Imperial Navy for over a century. *Chrysanthemums* are ubiquitous, being encountered with larger fleet elements as much as working alone.

This class of destroyer escort has been pressed into service in a variety of non-escort duties, including orbital patrols, police operations, garrison duties, and even limited strike missions.

TL15		Tons	Cost (MCr)
Hull	1,000 tons, Close Structure	—	40
	Reinforced	—	20
Armour	Bonded Superdense, Armour: 2	24	12
M-Drive	Thrust 6	60	120
J-Drive	Jump-4	105	157.5
Power Plant	Fusion (TL15), Power 1,280	64	128
Fuel Tanks	J-4, 8 weeks of operation	414	—
Bridge	Holographic Controls	20	6.25
Computer	Computer/35fib	—	45
Sensors	Advanced	5	5.3
Weapons	Fusion Barbette	5	4
	Particle Barbettes x2	10	16
	Triple Turrets (missile racks) x2	2	6.5
	Triple Turrets (sandcasters) x5	5	8.75
Ammunition	Missile Storage (384 missiles)	32	—
	Sandcaster Canister Storage (640 canisters)	32	—
Craft	Docking Space (40 tons)	44	11
	Pinnace	—	9.68
Systems	Fuel Processor (200 tons/day)	10	0.5
	Fuel Scoops	—	1
	Armoury	2	0.5
	Medical Bay	4	2
	Repair Drones	10	2
Staterooms	Standard x24	96	12
Software	Manoeuvre	—	—
	Intellect	—	—
	Library	—	—
	Jump Control/4	—	0.4
	Auto-Repair/1	—	5
	Evade/2	—	2
	Fire Control/2	—	4
Common Areas		24	2.4
Cargo		32	—
Total: MCr621.78			

Crew

Captain, Officers x3, Pilots x3, Astrogator, Medic, Maintenance x2, Engineers x7, Administrators x7, Gunners x20

Hull: 440

Running Costs

MAINTENANCE COST

Cr46634/month

PURCHASE COST

MCr559.602

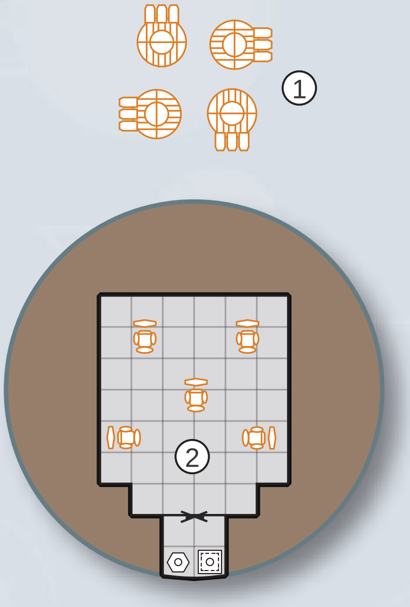
Power Requirements

Basic Ship Systems	200
Manoeuvre Drive	600
Jump Drive	400
Sensors	6
Weapons	57
Fuel Processor	10
Systems	1

1 square = 0.5 Ton

LEGEND

1. Sandcasters
2. Bridge
3. Missile racks
4. Stateroom
5. Medbay
6. Fuel processor
7. Armoury
8. Jump drive
9. Ammunition storage
10. Docking space
11. Power plant
12. Manoeuvre drive
13. Fusion barbette
14. Common area



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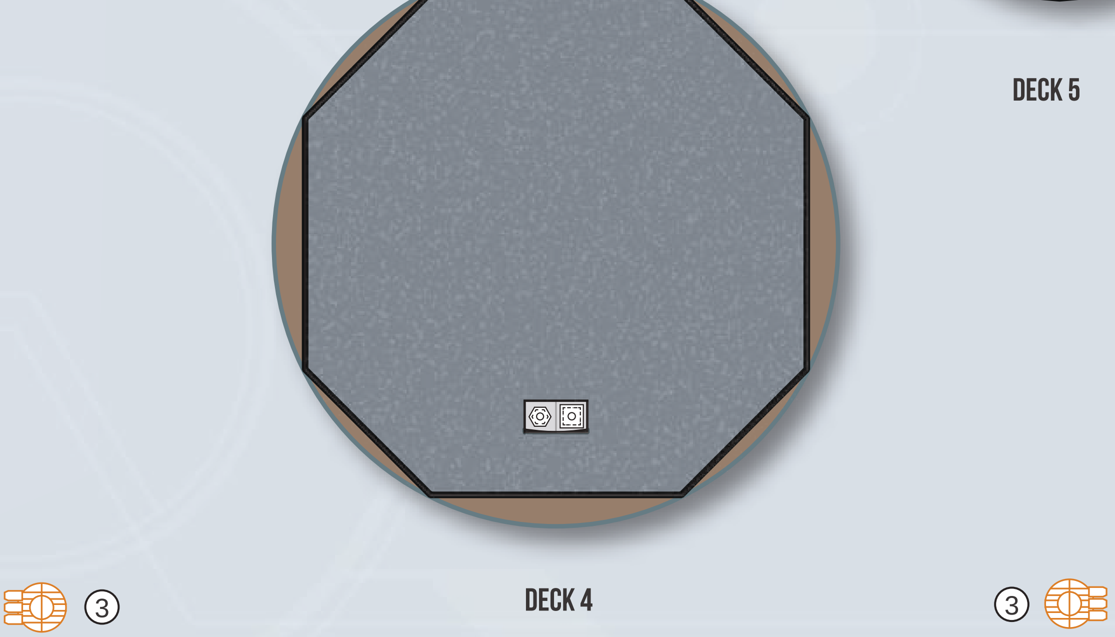

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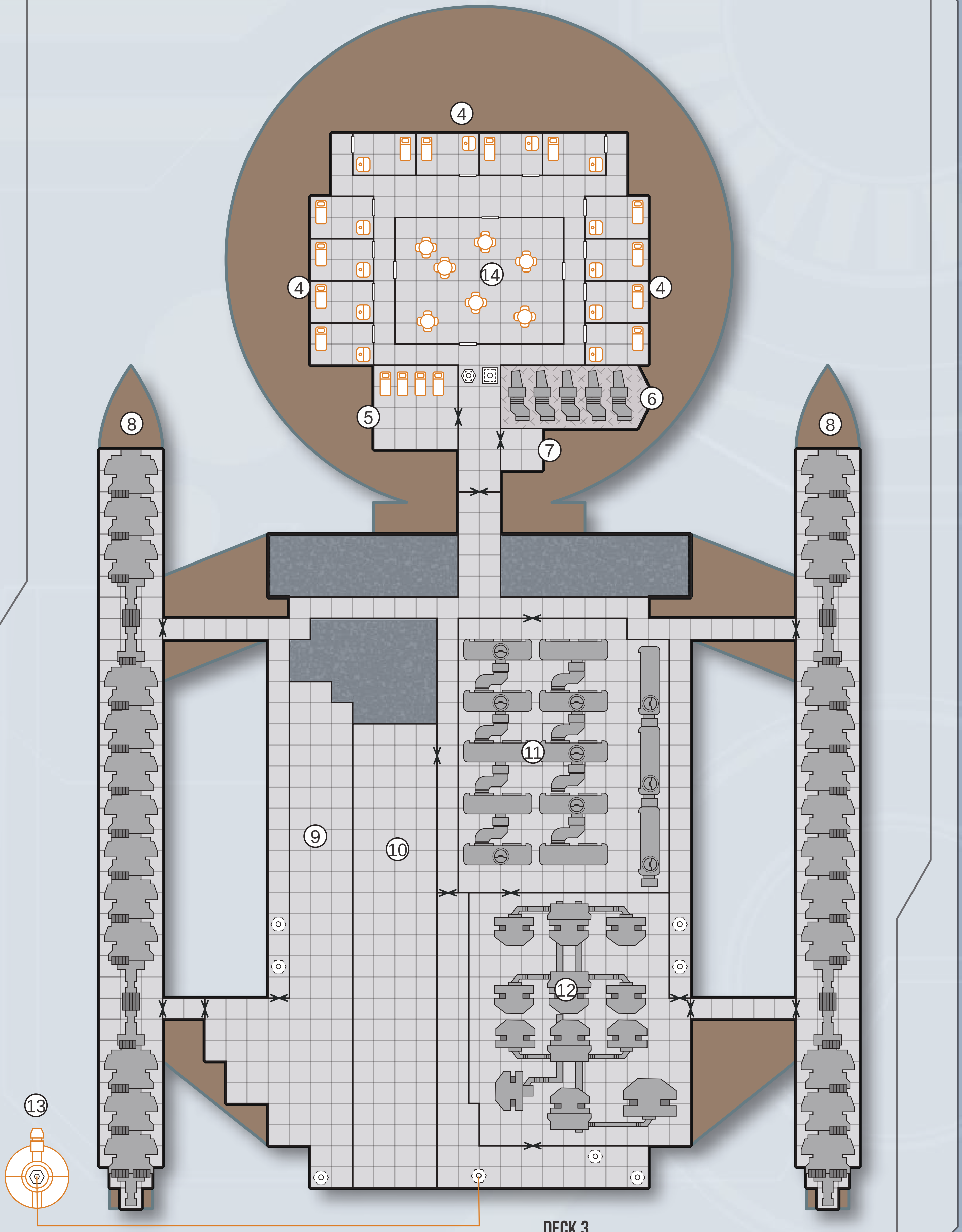
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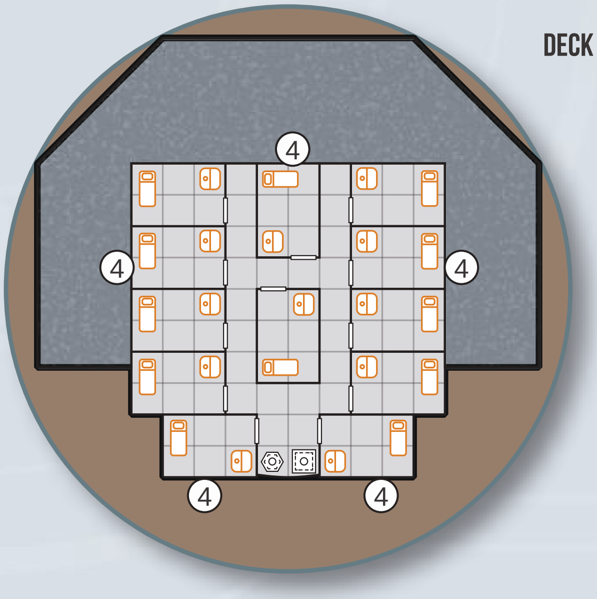
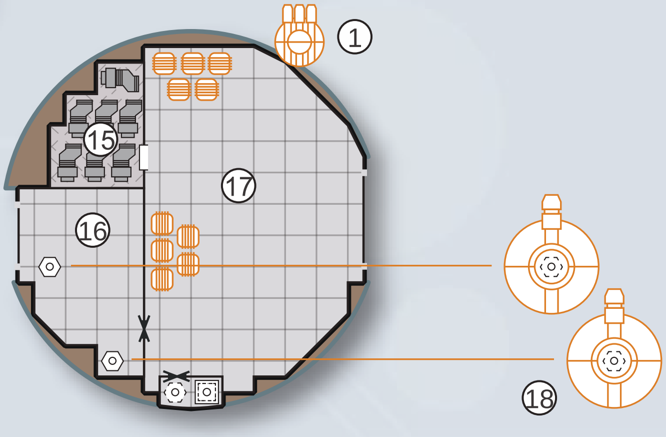
DECK 3

1 square = 0.5 Ton

DECK 2





DECK 1

LEGEND

1. Sandcasters
2. Bridge
3. Missile racks
4. Stateroom
5. Medbay
6. Fuel processor
7. Armoury
8. Jump drive
9. Ammunition storage
10. Docking space
11. Power plant
12. Manoeuvre drive
13. Fusion barbette
14. Common area
15. Sensors
16. Drones
17. Cargo hold
18. Particle barbettes

DESTROYER ESCORT

CLASS: FER-DE-LANCE

During the height of the Third Frontier War (979 to 986), high losses in civilian shipping and among transport vessels impressed into Imperial service resulted in the issuance of an Admiralty specification for a mid-sized escort vessel expressly for close protection of unarmed transport craft. The design which was finally accepted was the *Fer-de-lance* destroyer escort.

Performance characteristics for this class make it capable of staying with most Imperial fleets and thus this type of vessel can be found escorting most squadrons as well as more typical convoys.

TL15		Tons	Cost (MCr)
Hull	1,000 tons, Close Structure	—	40
	Reinforced	—	20
Armour	Bonded Superdense, Armour: 2	24	12
	Radiation Shielding	—	25
M-Drive	Thrust 6 (energy efficient x2)	60	150
J-Drive	Jump 4 (reduced fuel x2)	105	196.875
Power Plant	Fusion (TL15), Power 1,000	50	100
Fuel Tanks	J-4, 8 weeks of operation	370	—
Bridge	Holographic Controls	20	6.25
Computer	Computer/35fib	—	45
Sensors	Advanced	5	5.3
	Countermeasures Suite	2	4
Weapons	Missile Barbettes (accurate) x4	20	20
	Triple Turrets (accurate, high yield beam lasers) x6	6	19.5
Ammunition	Missile Storage (360 missiles)	30	—
Craft	Docking Spaces (50 tons) x2	110	27.5
	Modular Cutters x2	—	23.86
Systems	Fuel Processor (180 tons/day)	9	0.45
	Fuel Scoops	—	1
	Repair Drones	10	2
	Medical Bay	4	2
	Armoury	2	0.5
Staterooms	Standard x28	112	14
Software	Manoeuvre	—	—
	Intellect	—	—
	Jump Control/4	—	0.4
	Library	—	—
	Auto-Repair/1	—	5
	Evade/2	—	2
	Fire Control/2	—	4
Common Areas		11	1.1
Cargo		50	—
Total: MCr727.735			

Crew

Captain, Pilots x3, Astrogator, Engineers x7, Maintenance x2, Gunners x20, Administrator, Sensops x3, Small Craft Crew x4, Officers x4, Medic

Hull: 440

Running Costs

MAINTENANCE COST

Cr54581/month

PURCHASE COST

MCr654.9615

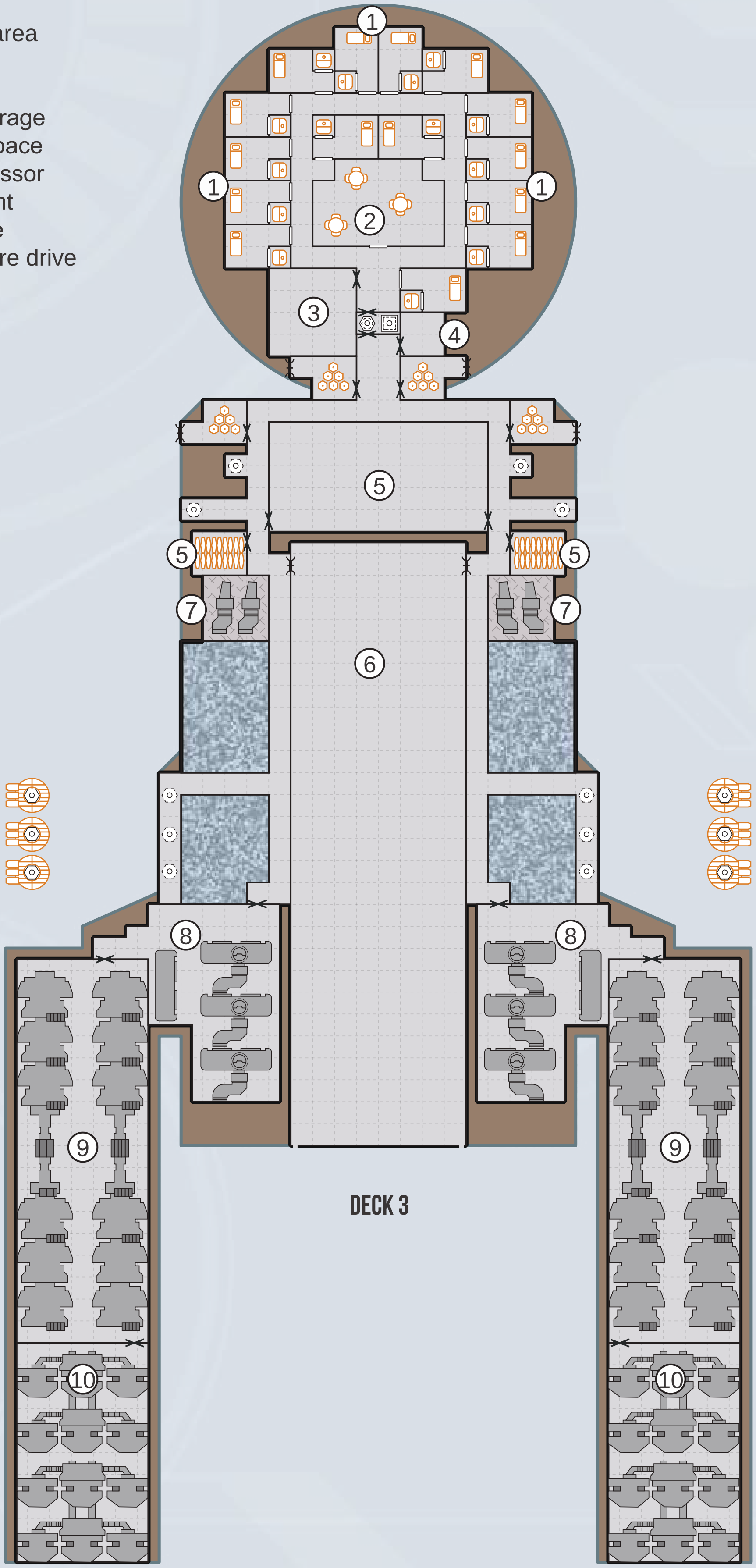
Power Requirements

Basic Ship Systems	200
Manoeuvre Drive	300
Jump Drive	400
Sensors	6
Weapons	78
Fuel Processor	9
Medical Bays	1

LEGEND

1. Stateroom
2. Common area
3. Medbay
4. Armoury
5. Missile storage
6. Docking space
7. Fuel processor
8. Power plant
9. Jump drive
10. Manoeuvre drive

1 square = 0.5 Ton



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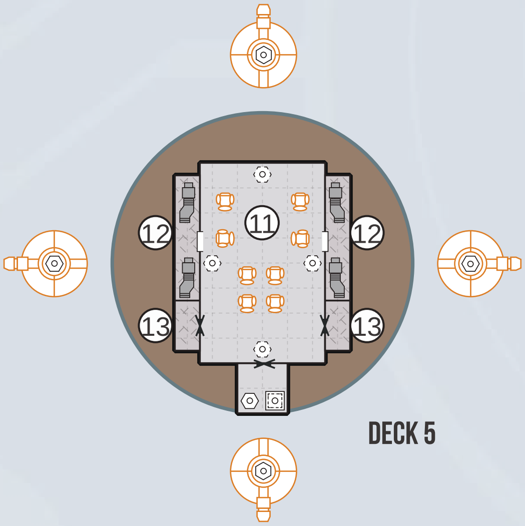
DECK 3

LEGEND

11. Bridge
12. Sensors
13. Countermeasures suite
14. Staterooms
15. Cargo hold

1 square = 0.5 Ton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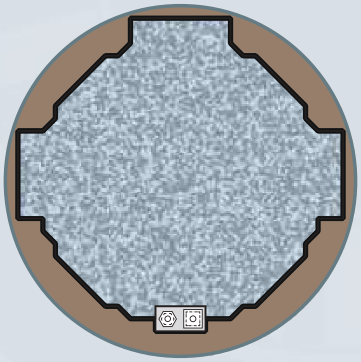

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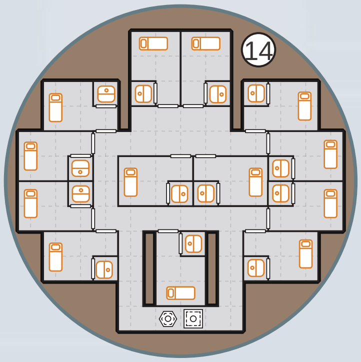

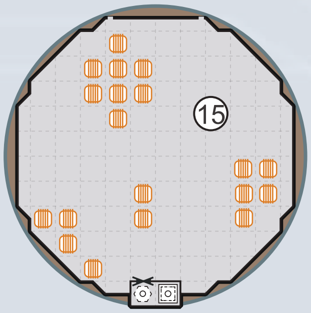

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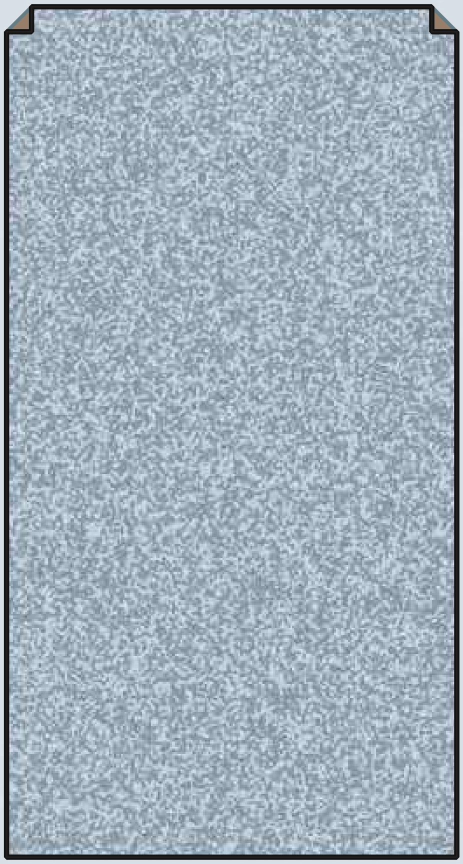


DECK 2

COLONIAL CRUISER

CLASS: KINUNIR

The *Kinunir* colonial cruiser (also known by a variety of designations: vanguard cruiser, battlecruiser and vanguard escort) is more of a fast armed troop transport than a true cruiser. It is an ill-fated model, discontinued after a production run of only 20. Several have been lost in action. One has been converted into an orbital prison.

Its true purpose was as an experimental platform, which helped the class gain access to black globe generators that are usually reserved for much larger ships. More than one was fitted with an experimental AI, which can be represented by adding a secondary Computer 35/bis (using 'bis' for Conscious Intelligence rather than Jump Control) that only runs the TL16 version of Conscious Intelligence, adding MCr70 to the price and Cr5833 to the monthly maintenance. These AIs worked poorly enough that they help explain why this model was ill-fated.

The design attempts to serve many missions at once, none well, with 10 marines each assigned for boarding actions, meteoric assault and mechanised deployment plus a four-marine command section on the air/raft, leaving one marine on the ship as a liaison. In practice, it was rare to have immediate use for more than one role at a time, so using a trio of modified ship's boats that could serve all roles and training the marines for all missions would have been superior. Some ship-design libraries include the *Kinunir* as an example of what not to do in this regard.

Virtual gunners crew the screens and missiles, one virtual gunner replacing both crew positions for each installation. Live gunners crew the barbettes, where higher skill is more useful. The marines are counted as basic passengers, needing neither officer nor steward crew positions, as they have no function aboard the ship. Not enough *Kinunirs* were produced to qualify for mass production discounts, although their pinnaces did, so the discounted cost is listed here.

Crew

Captain, Pilots x3, Astrogator, Engineers x6, Mechanics x2, Medic, Gunners x4, Administrator, Officer, Marines x35

Hull: 528

Running Costs

MAINTENANCE COST

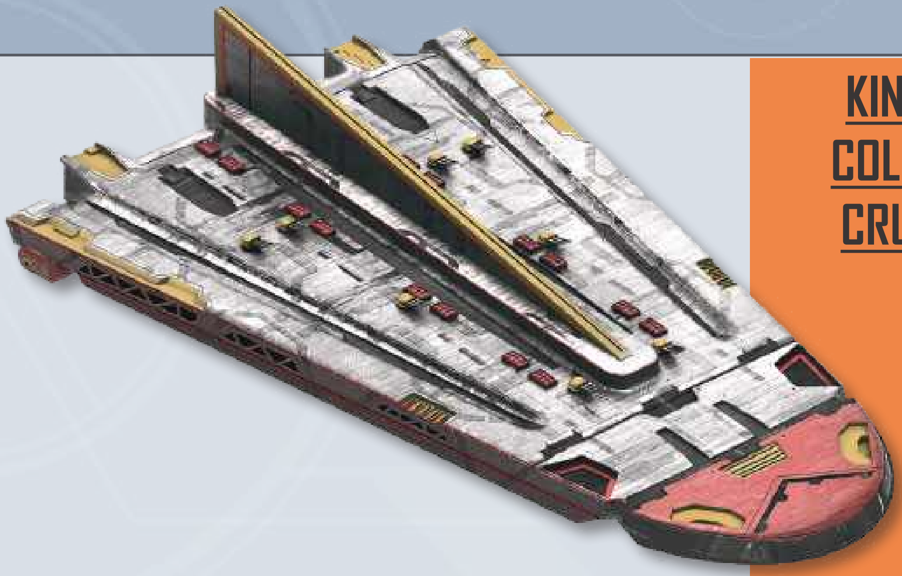
Cr64778/month

PURCHASE COST

MCr777.339

Power Requirements

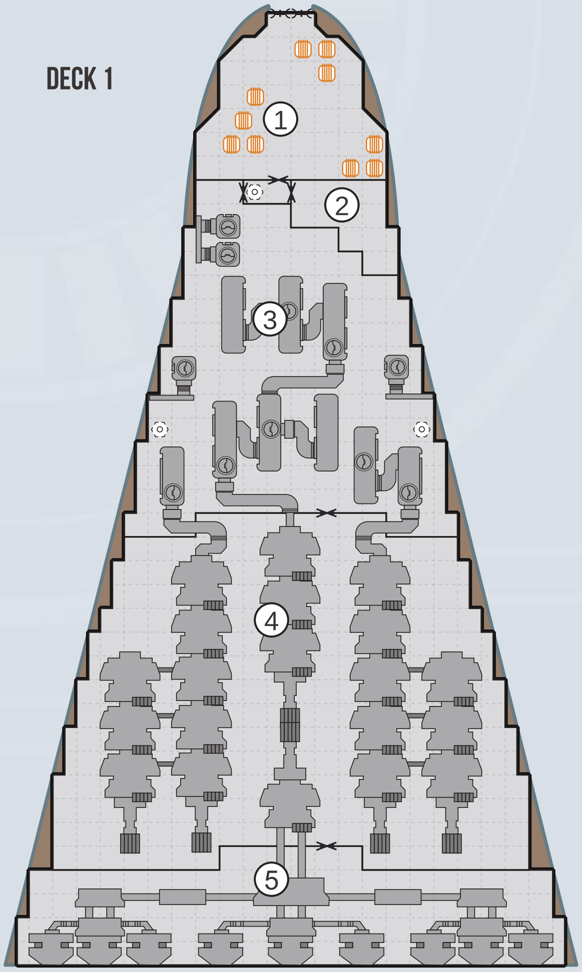
Basic Ship Systems	240
Manoeuvre Drive	480
Jump Drive	480
Sensors	6
Weapons	192
Medical Bay	1



KINUNIR COLONIAL CRUISER

TL15		Tons	Cost (MCr)
Hull	1,200 tons, Standard	—	60
	Reinforced	—	30
Armour	Bonded Superdense, Armour: 4	38.4	19.2
M-Drive	Thrust 4	48	96
J-Drive	Jump 4 (reduced fuel)	125	206.25
Power Plant	Fusion (TL15), Power 1,400	70	140
Fuel Tanks	J-4, 4 weeks of operation	463	—
Bridge	Holographic Controls	40	7.5
Computer	Computer/35	—	30
Sensors	Advanced	5	5.3
Weapons	Triple Turrets (missile racks) x2	2	6.5
	Particle Barbettes x2	10	16
	Point Defence Laser Battery (Type III)	20	20
Ammunition	Missile Storage (120 missiles)	10	0
Screens	Nuclear Dampers x5	50	50
	Black Globe Generator	50	100
Craft	Docking Space (40 tons)	44	11
	Pinnace	—	9.68
	Docking Space (17 tons)	16.5	4.25
	G/Carrier	—	11.58
	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
Systems	Fuel Processor (100 tons/day)	5	0.25
	Fuel Scoops	—	1
	High Survivability Capsules x20	10	2
	Workshop	6	0.9
	Medical Bay	4	2
	Briefing Room	4	0.5
	Armoury	9	2.25
Staterooms	Standard x20	80	10
	Barracks x35	35	1.75
Software	Manoeuvre	—	—
	Jump Control/4	—	0.4
	Advanced Fire Control/1	—	12
	Virtual Gunner/0	—	1
	Evade/2	—	2
	Library	—	—
	Intellect	—	—
Common Areas		29	2.9
Cargo		21.1	—
Total: MCr863.71			

1 square = 0.5 Ton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DECK 2
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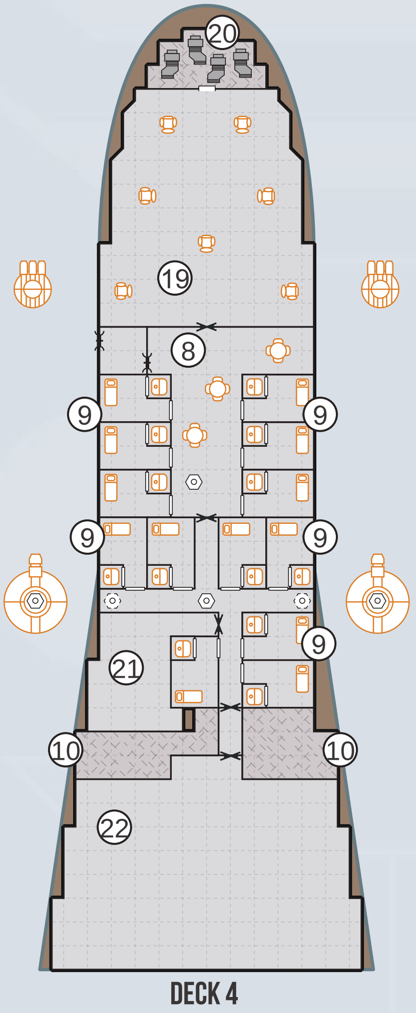
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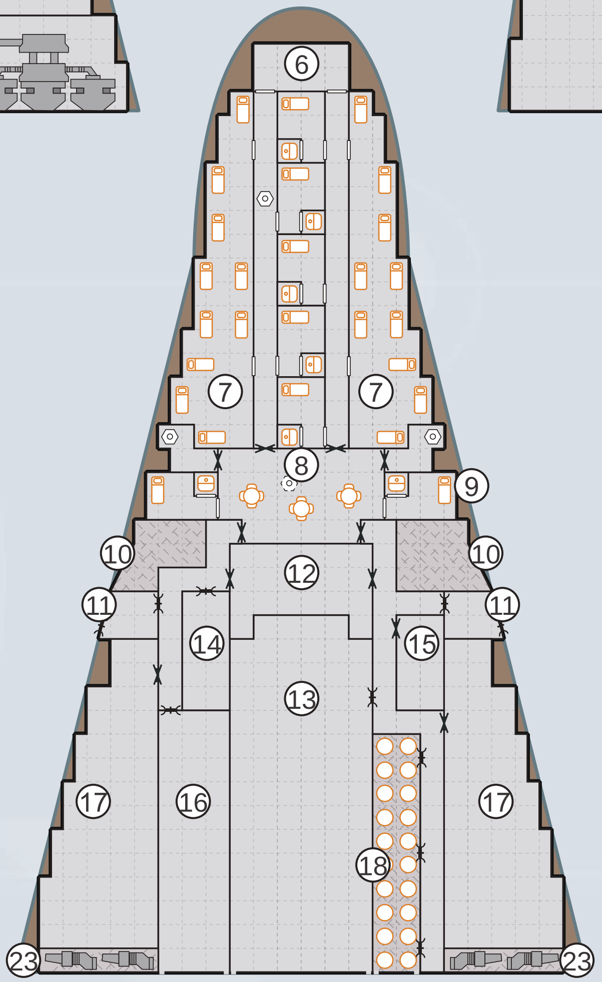
DECK 4

LEGEND

1. Cargo hold
2. Workshop
3. Power plant
4. Jump drive
5. Manoeuvre drive
6. Briefing room
7. Barracks
8. Common area
9. Stateroom
10. Batteries
11. Airlock
12. Ammunition storage
13. Docking space
14. Air/raft
15. Medbay
16. G/Carrier
17. Screens
18. Capsules
19. Bridge
20. Sensors
21. Armoury
22. Black globe
23. Fuel processor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DECK 3

MERCHANT CRUISER

CLASS: LEVIATHAN

The *Leviathan* was developed from previous designs and is primarily intended for independent cruising in undeveloped trade areas; high survivability is also a design factor. The vessels are partially streamlined, allowing wilderness refuelling operations as well as landings in Atmospheres 0 and 1. Atmospheric landings are otherwise not recommended, hence the large complement of small craft. The energy-efficient weapons allow all primary systems except the fuel processor to be run simultaneously should the ship be faced with combat. A luxury stateroom is maintained for the owner-aboard when present.

TL12		Tons	Cost (MCr)
Hull	1,800 tons, Standard	—	90
M-Drive	Thrust 4	72	144
	Thrust 2 (backup)	36	72
J-Drive	Jump 3	140	210
	Jump 2 (backup)	95	142.5
Power Plant	Fusion (TL12), Power 1,665	111	111
Fuel Tanks	J-3, 16 weeks of operation	588	—
Bridge	—	40	9
	Smaller (backup)	20	4.5
Computer	Computer/10bis,fib	—	0.32
Backup	Computer/5bis,fib	—	0.06
Sensors	Civilian Grade	1	3
Weapons	Double Turrets (energy efficient x3 beam lasers) x6	6	12
	Fixed Mounts (missile racks) x2	—	1.7
	Torpedo Barbettes x2	10	6
Ammunition	Missile Storage (48 missiles)	4	0.4
	Torpedo Storage (12 torpedoes)	4	0.4
Craft	Docking Space (4 tons)	5	1.25
	Air/Raft	—	0.25
	Docking Space (20 tons) x2	44	11
	Launches x2	—	5.26
	Docking Space (40 tons)	44	11
	Pinnace	—	9.68
	Docking Space (95 tons)	105	26.25
	Shuttle	—	16.305
Systems	Fuel Processor (300 tons/day)	15	0.75
	Fuel Scoops	—	1
	Multi-Environment Space	21	0.5
	Cargo Crane	3.5	3.5
	Probe Drones x5	1	0.5
	Cargo Airlock	4.5	0.45
	Armoury	2	0.5

Crew

Captain, Pilots x3, Astrogator, Engineers x13, Maintenance x2, Medics x2, Gunners x10, Steward, Administrator, Officer

Hull: 720

Running Costs

MAINTENANCE COST

Cr69942/month

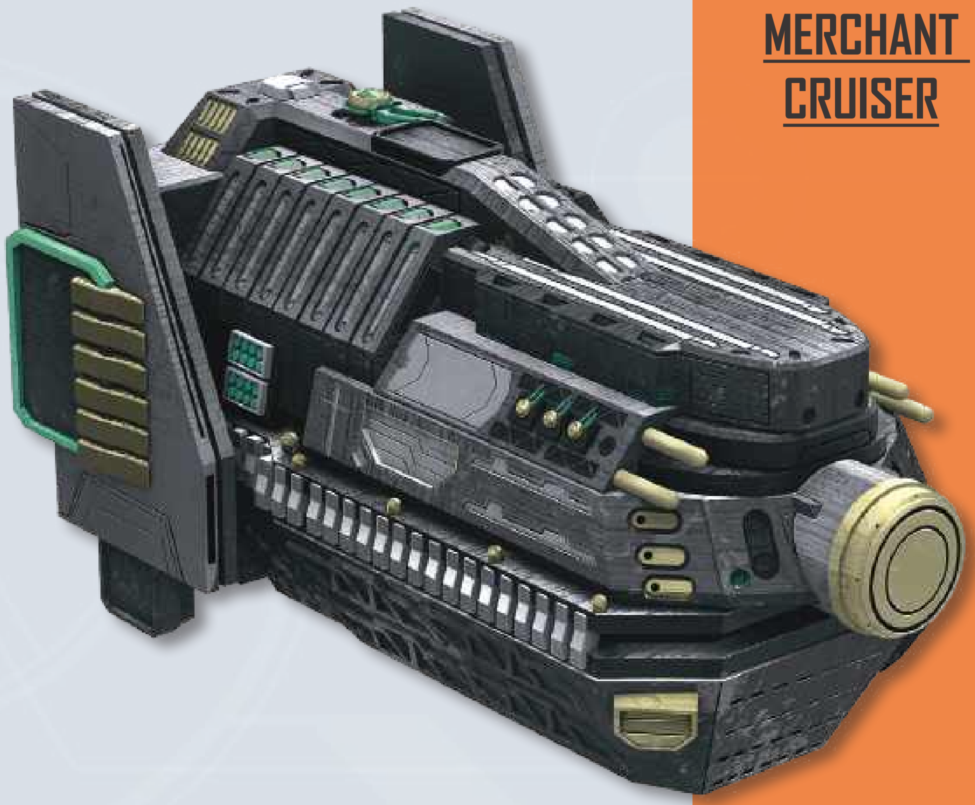
PURCHASE COST

MCr839.2995

Power Requirements

Basic Ship Systems	360
Manoeuvre Drive	720
Jump Drive	540
Sensors	1
Weapons	22
Fuel Processor	15
Multi-Environment Space	1
Biosphere	17
Medical Bay	2
Low Berths	1

Systems	Biosphere	17	3.4
	Briefing Rooms x3	12	1.5
	Medical Bays x2	8	4
	Re-entry Capsules x4	2	0.08
	Workshops x4	24	3.6
Staterooms	Standard x31	124	15.5
	High	6	0.8
	Luxury	10	1.5
	Low Berths x6	3	0.3
Software	Manoeuvre	—	—
	Intellect	—	—
	Jump Control/3	—	0.3
	Library	—	—
	Evade/1	—	1
	Fire Control/1	—	2
Common Areas		35	3.5
Cargo		187	—
Total: MCr932.555			

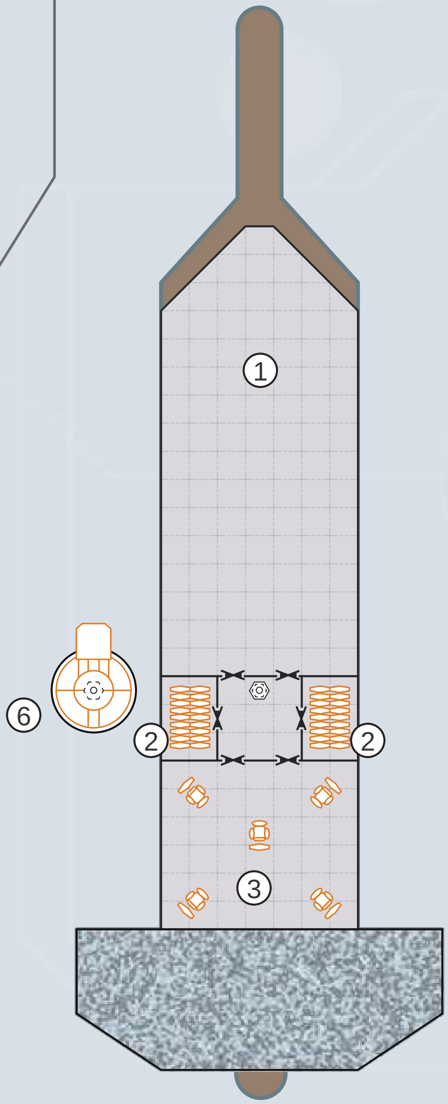


LEVIATHAN MERCHANT CRUISER

LEGEND

1. Launch docking space
2. Torpedo storage
3. Auxiliary bridge
4. Pinnace docking space
5. Workshop
6. Torpedo barbette

1 square = 0.5 Ton



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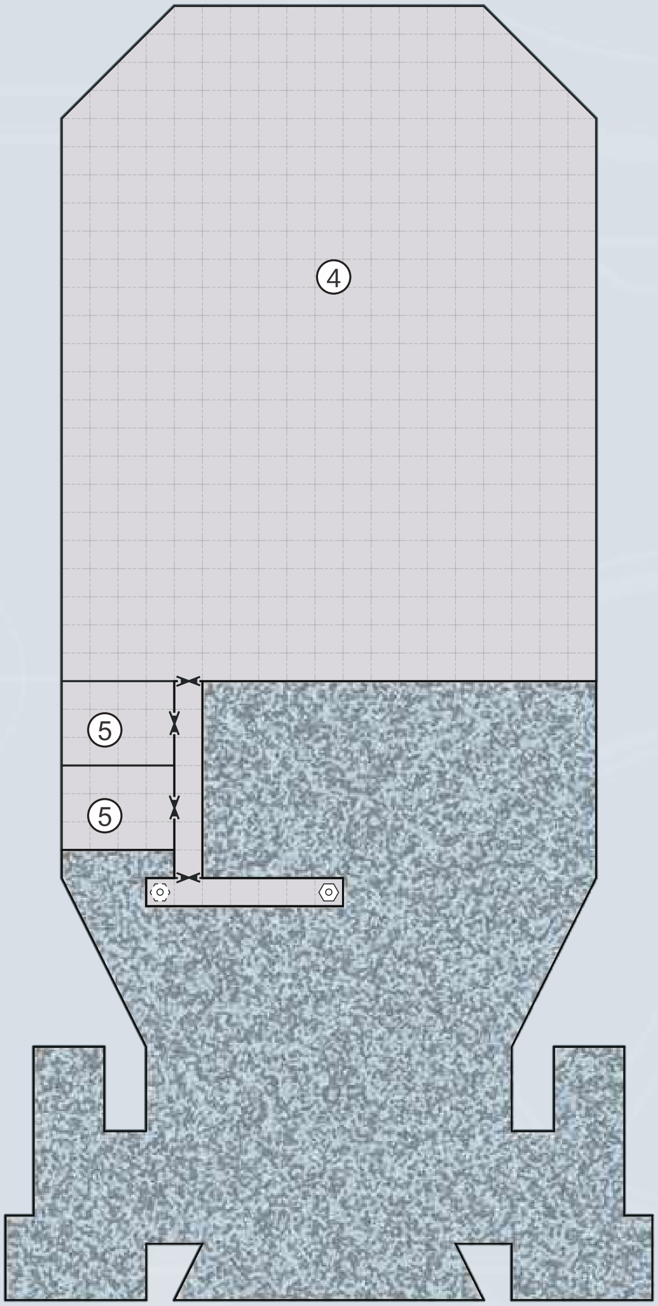
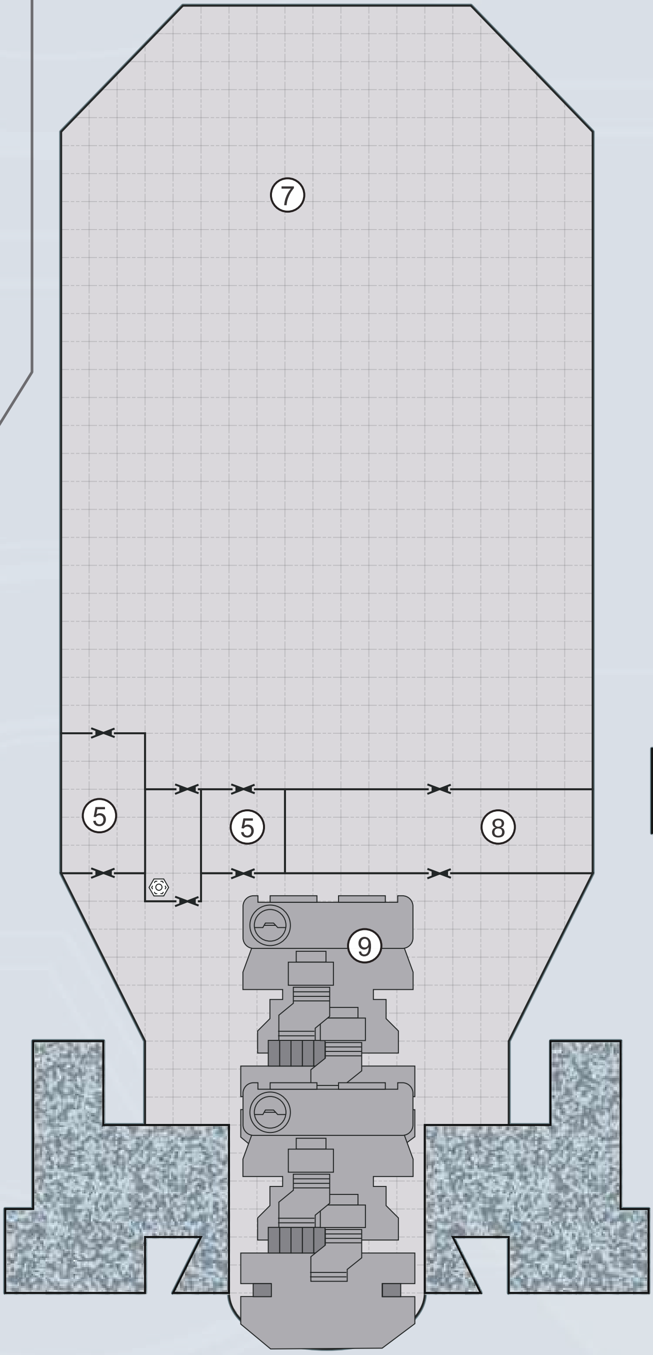


DECK 2

LEGEND

1. Launch docking space
2. Torpedo storage
3. Auxiliary bridge
4. Pinnace docking space
5. Workshop
6. Torpedo barbette
7. Shuttle docking space
8. Biosphere
9. Manoeuvre drive
10. Missile storage
11. Beam lasers
12. Low berths

1 square = 0.5 Ton



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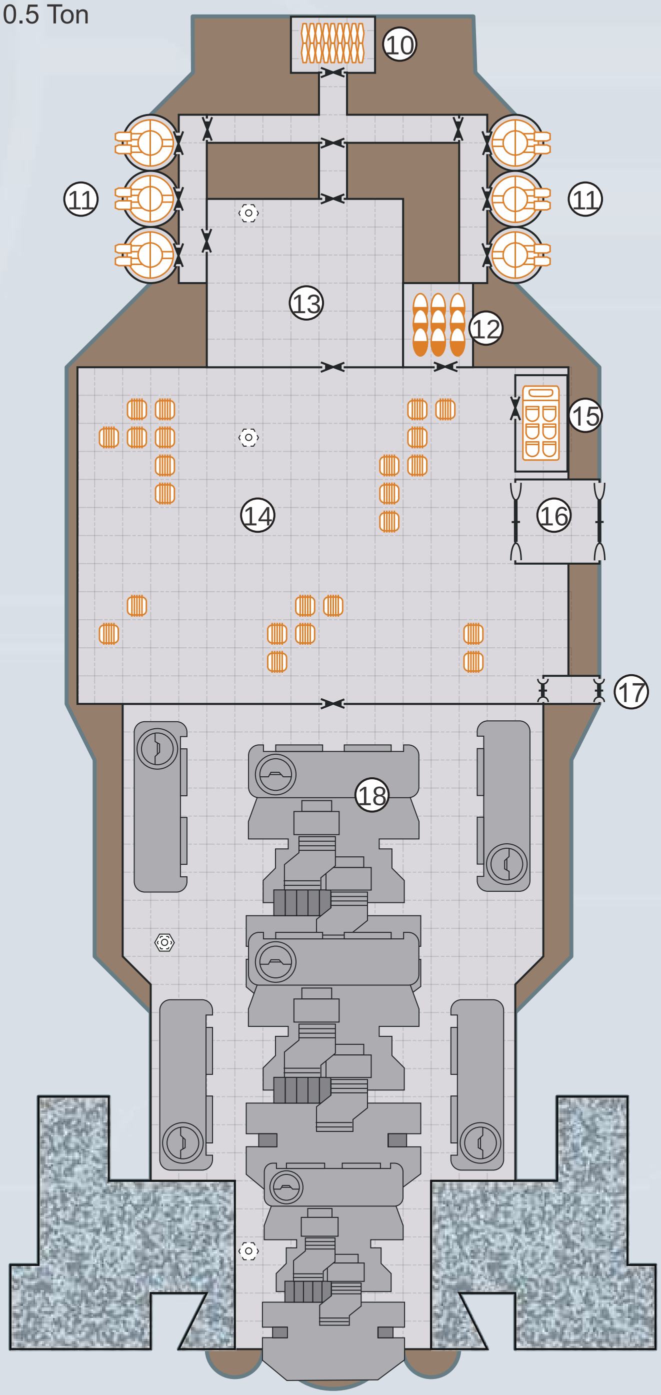


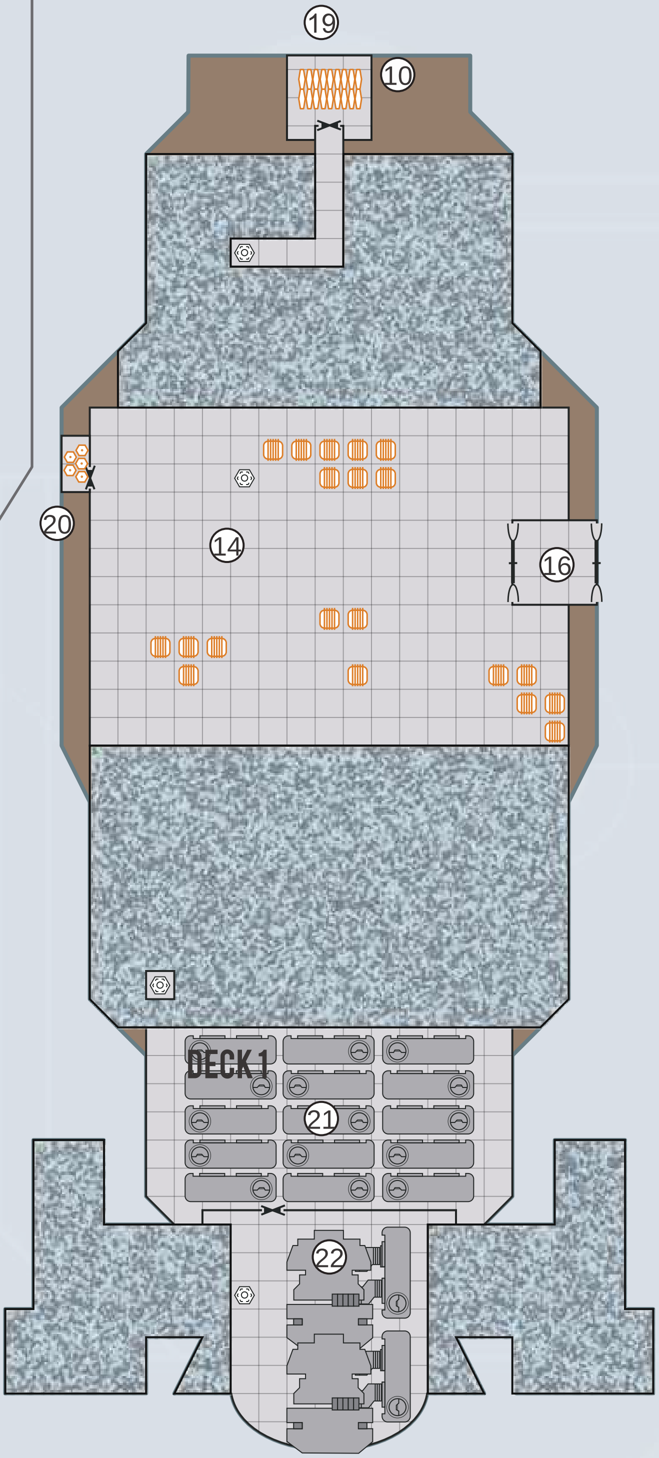
DECK 4

13. Multi environment space
14. Cargo hold
15. Air/raft
16. Cargo airlock
17. Airlock
18. Jump drive

1 square = 0.5 Ton

LEGEND

19. Missile mount (2 decks high)
20. Drones
21. Power plant
22. Auxiliary manoeuvre drive
23. High stateroom
24. Re-entry capsule
25. Armoury
26. Medbay
27. Luxury stateroom
28. Common area
29. Staterooms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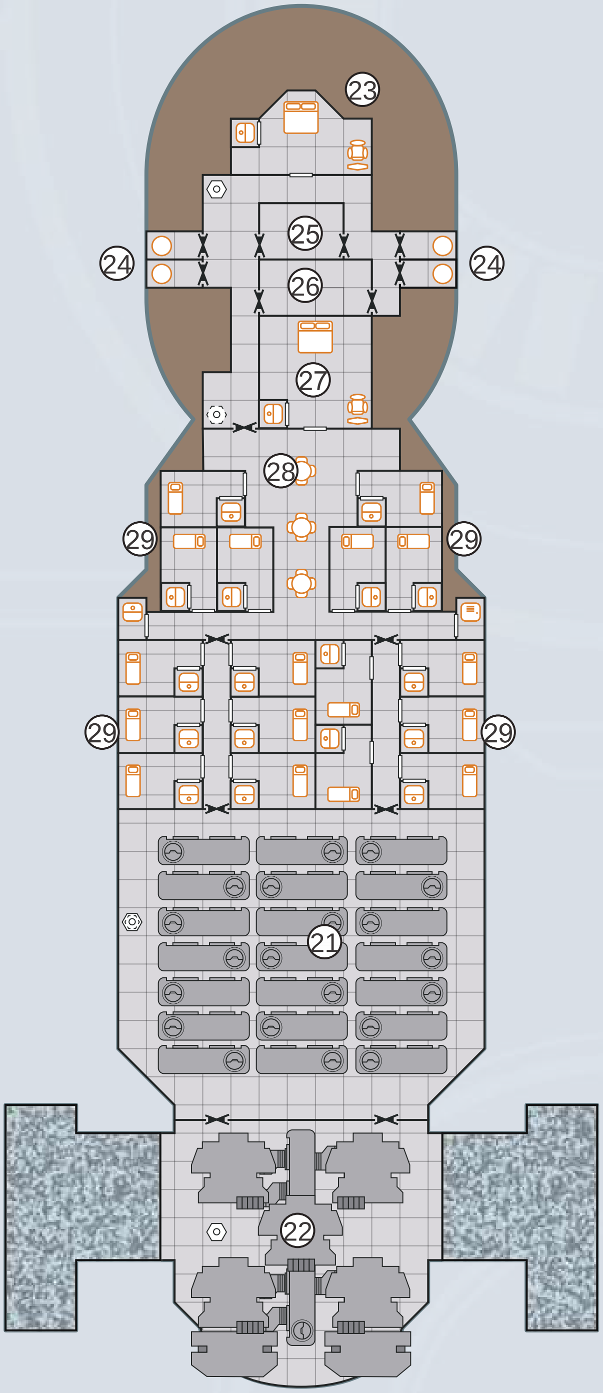
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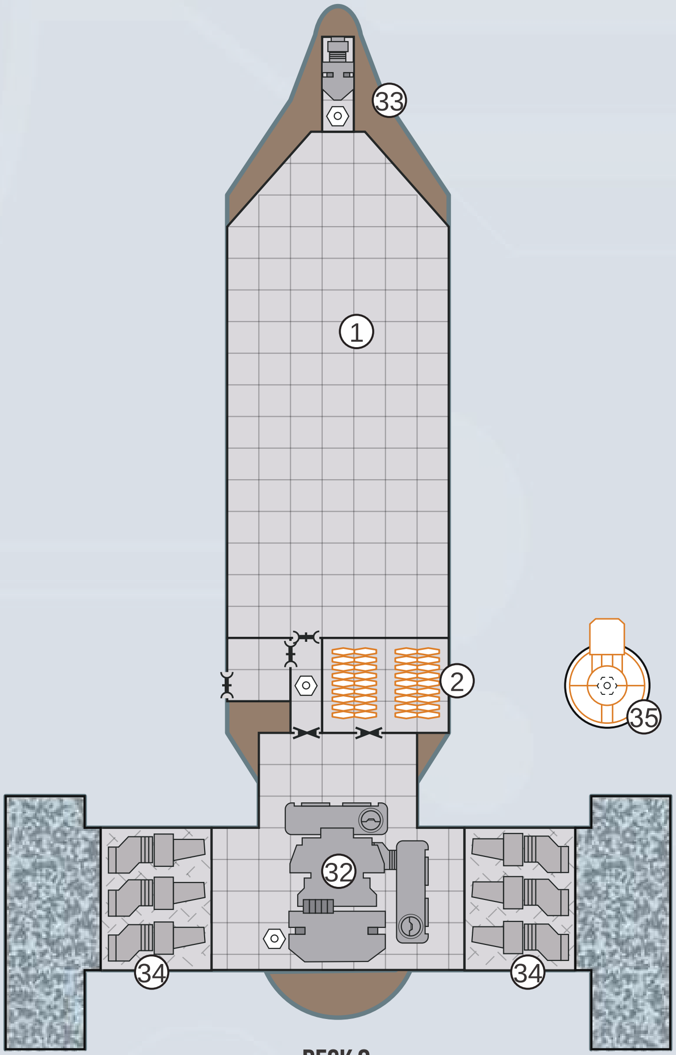
DECK 6

LEGEND

1. Launch docking space
2. Torpedo storage
17. Airlock
28. Common area
29. Staterooms
30. Main bridge
31. Briefing room
32. Auxiliary jump drive
33. Sensors
34. Fuel processor
35. Torpedo barbette

1 square = 0.5 Ton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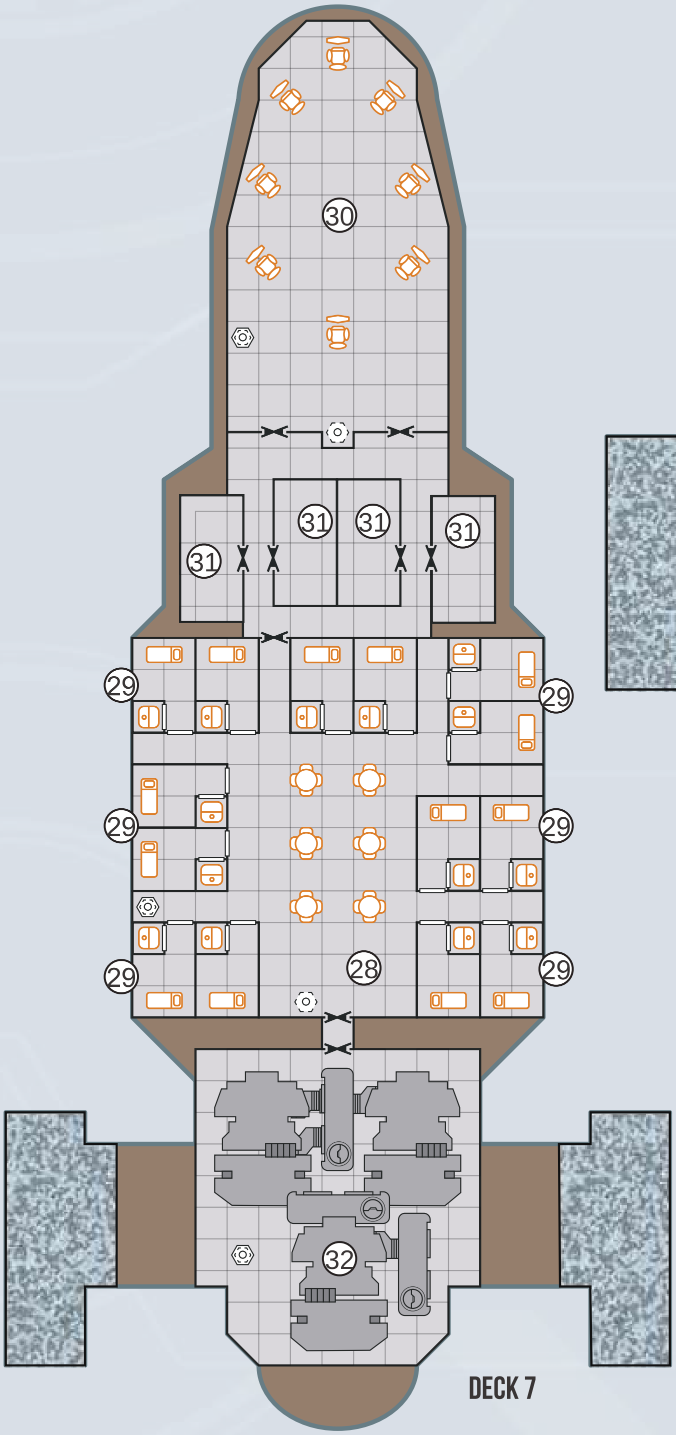
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DECK 7

CARGO CARRIER

CLASS: MK MORA

The Al Morai corporation maintains a fleet of 53 type *MK Mora* cargo carriers (not enough to receive the discount for standard designs), plying fixed routes of select Class A and B starports throughout the Spinward Marches, armed and accompanied by surplus *Gazelle* close escorts as deterrents to piracy. Generally named for systems along the route, these freighters maximise cargo space by using a cramped bridge, an undersized power plant that requires dimming ship's power when initiating a jump-4, turrets controlled via software and fuel/cargo containers to maximise cargo on shorter jumps. Al Morai facilities at each stop supply refined fuel, so no processors are installed. Two pinnaces for ferrying of passengers and cargo, and for emergency use as lifeboats. The ship has 14 rooms for crew (single occupancy for the captain, chief engineer and medic; double occupancy otherwise) and 30 passenger staterooms.

TL15		Tons	Cost (MCr)
Hull	3,000 tons, Close Structure	—	120
	Light hull	—	30
M-Drive	Thrust 1	30	60
J-Drive	Jump 4 (decreased fuel x2)	305	571.875
Power Plant	Fusion (TL15), Power 1,520	76	152
Fuel Tanks	J-2, 4 weeks of operation	548	—
Bridge	Smaller Bridge	40	7.5
Computer	Computer/15bis	—	3
Sensors	Military Grade	2	4.1
Weapons	Triple Turrets (long range, high yield pulse lasers x2, sandcaster) x6	6	25.5
	Triple Turrets (missile racks x2, accurate, high yield beam laser) x4	4	13
Craft	Docking Spaces (40 tons) x2	88	22
	Pinnaces x2	—	19.36
Systems	Fuel/Cargo Containers (270 tons) x2	567	2.7
	Cargo Crane	6.5	6.5
	Loading Belt (TL12) x3	3	0.03
	Medical Bay	4	2
Staterooms	Standard x44	176	22
Software	Manoeuvre	—	—
	Jump Control/4	—	0.4
	Library	—	—
	Virtual Gunner/1	—	5
	Intellect	—	—
Common Areas		44	4.4
Cargo		1,100.5	—
Total: MCr1011.365			

Crew

Captain, Pilots x3, Astrogator, Engineers x11, Maintenance x3, Medic, Stewards x3, Administrator, Officer

Hull: 1,080

Running Costs

MAINTENANCE COST

Cr84281/month

PURCHASE COST

MCr1011.365

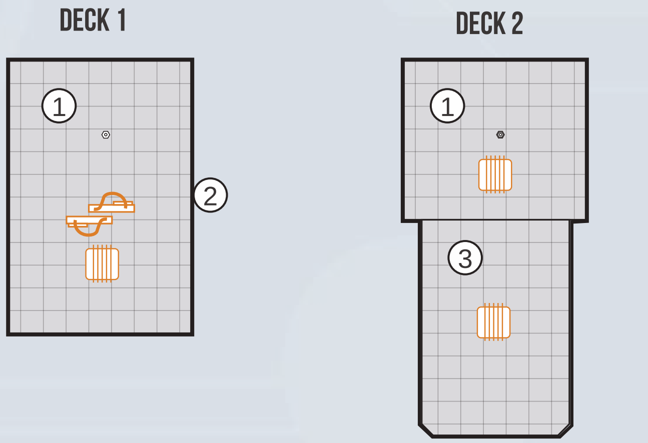
Power Requirements

Basic Ship Systems	600
Manoeuvre Drive	300
Jump Drive	1,200
Sensors	1
Weapons	74
Loading Belts	3
Medical Bay	1

LEGEND

1. Cargo hold
2. Loading belt
3. Fuel/cargo container

1 square = 2 tons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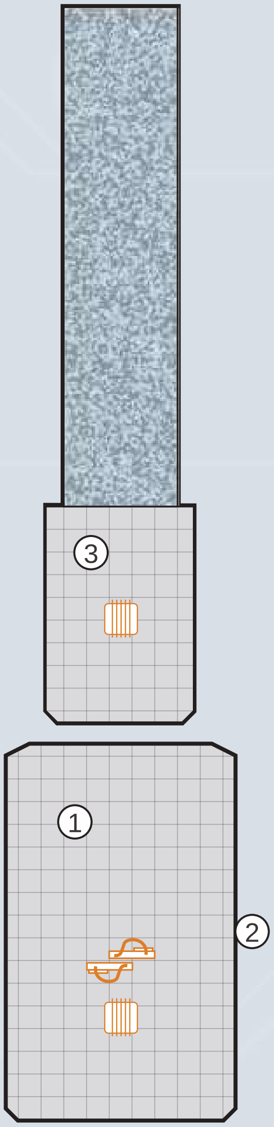

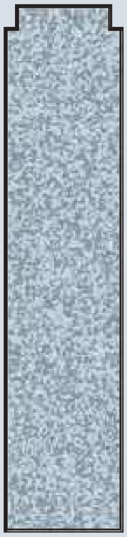

1 square = 2 tons

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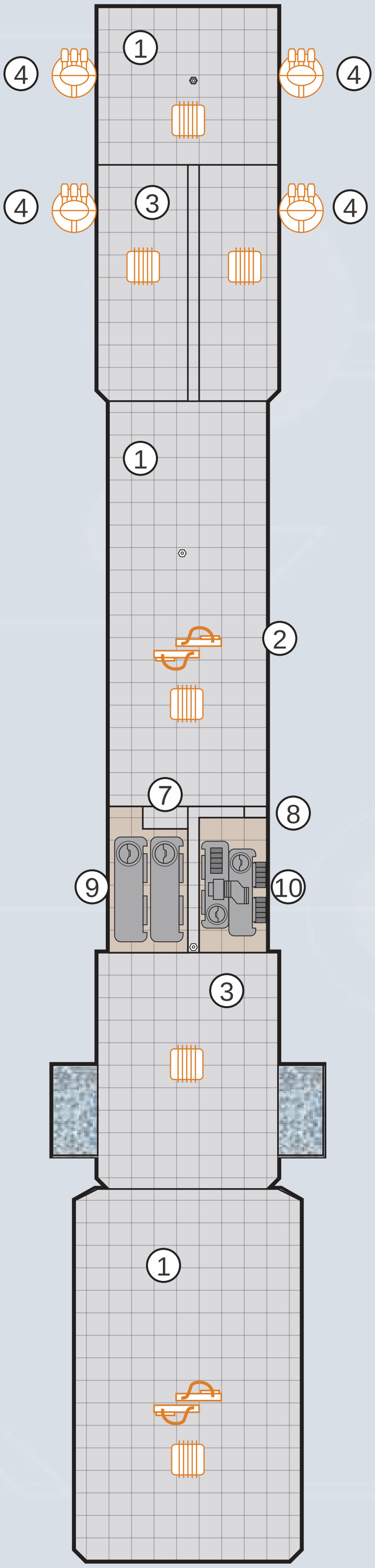
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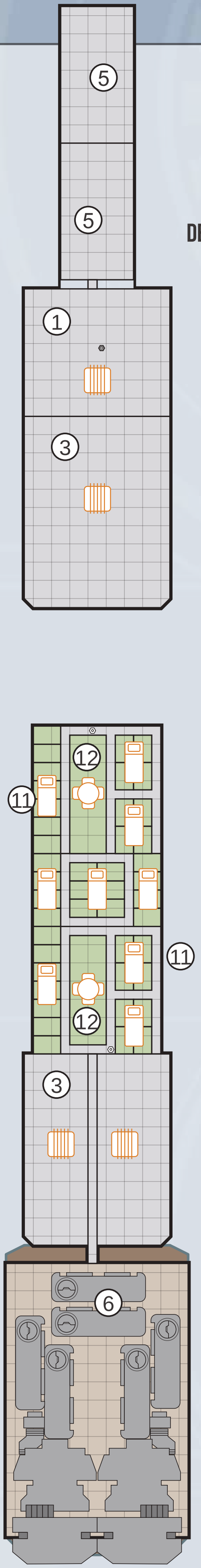
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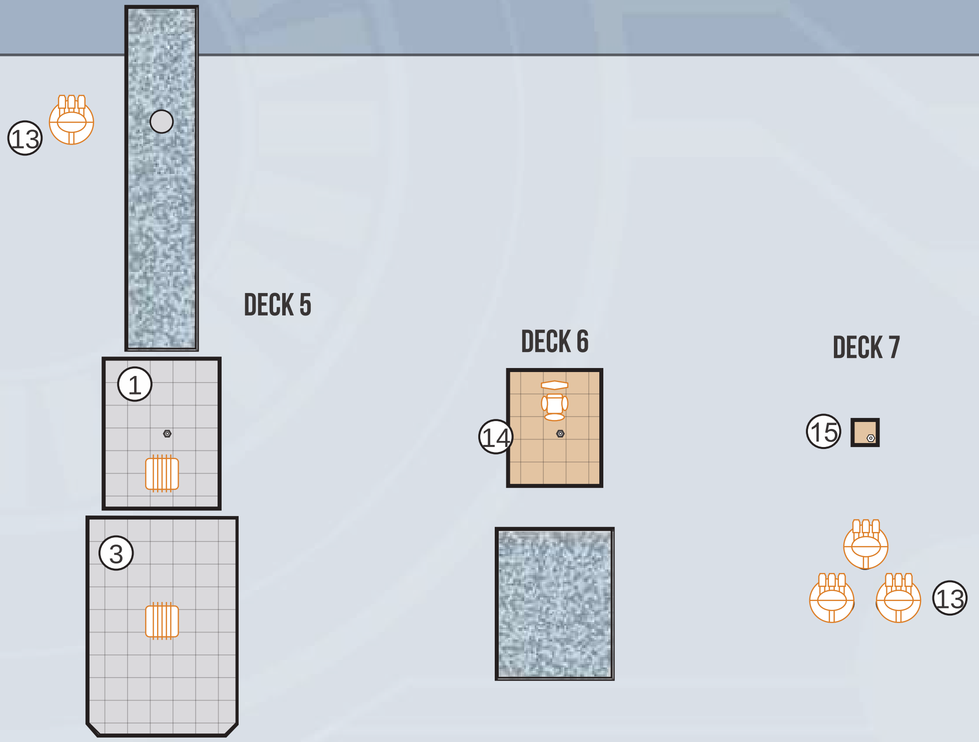
LEGEND

1. Cargo hold
2. Loading belt
3. Fuel/cargo container
4. Sandcaster/pulse lasers
5. Docking space
6. Jump drive
7. Medbay
8. Airlock
9. Power plant
10. Manoeuvre drive
11. Staterooms
12. Common area

1 square = 2 tons



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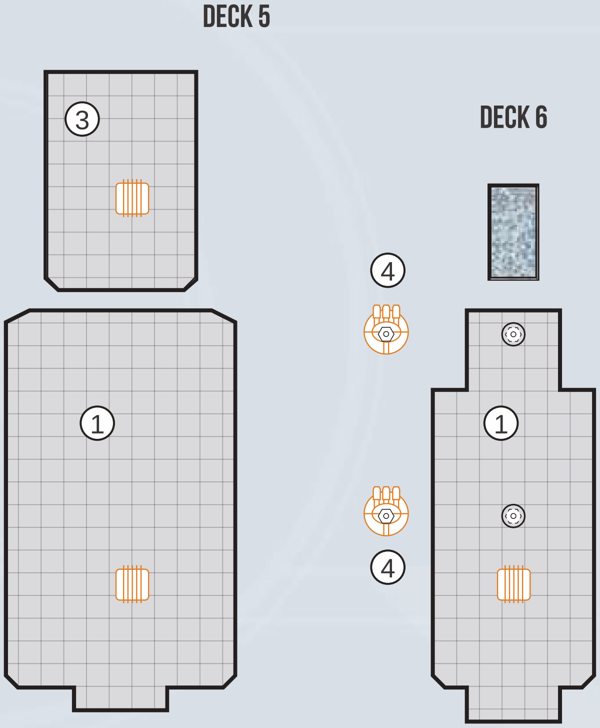
LEGEND

1. Cargo hold
2. Loading belt
3. Fuel/cargo container
4. Sandcaster/pulse lasers
5. Docking space
6. Jump drive
7. Medbay
8. Airlock
9. Power plant
10. Manoeuvre drive
11. Staterooms
12. Common area
13. Missile racks/beam laser
14. Bridge
15. Sensors



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DESTROYER

CLASS: MIDU AGASHAAM

The *Midu Agashaam* destroyer is a streamlined escort vessel intended to supplement fleet defences with anti-fighter and anti-small craft ships. As yet, the class has achieved only limited production and is still considered to be experimental or developmental in status. The Admiralty, in its evaluation efforts, has thus far deployed the ships in over-sized squadrons of 10 to 20 vessels and has committed them to operations only with the Navy's major battle fleets.

MIDU AGASHAAM DESTROYER

Crew

Captain, Officers x8, Pilots x3, Astrogator, Medic, Maintenance x6, Engineers x19, Administrators x3, Gunners x54

Hull: 1,320

Running Costs

MAINTENANCE COST

Cr154220/month

PURCHASE COST

MCr1850.634

Power Requirements

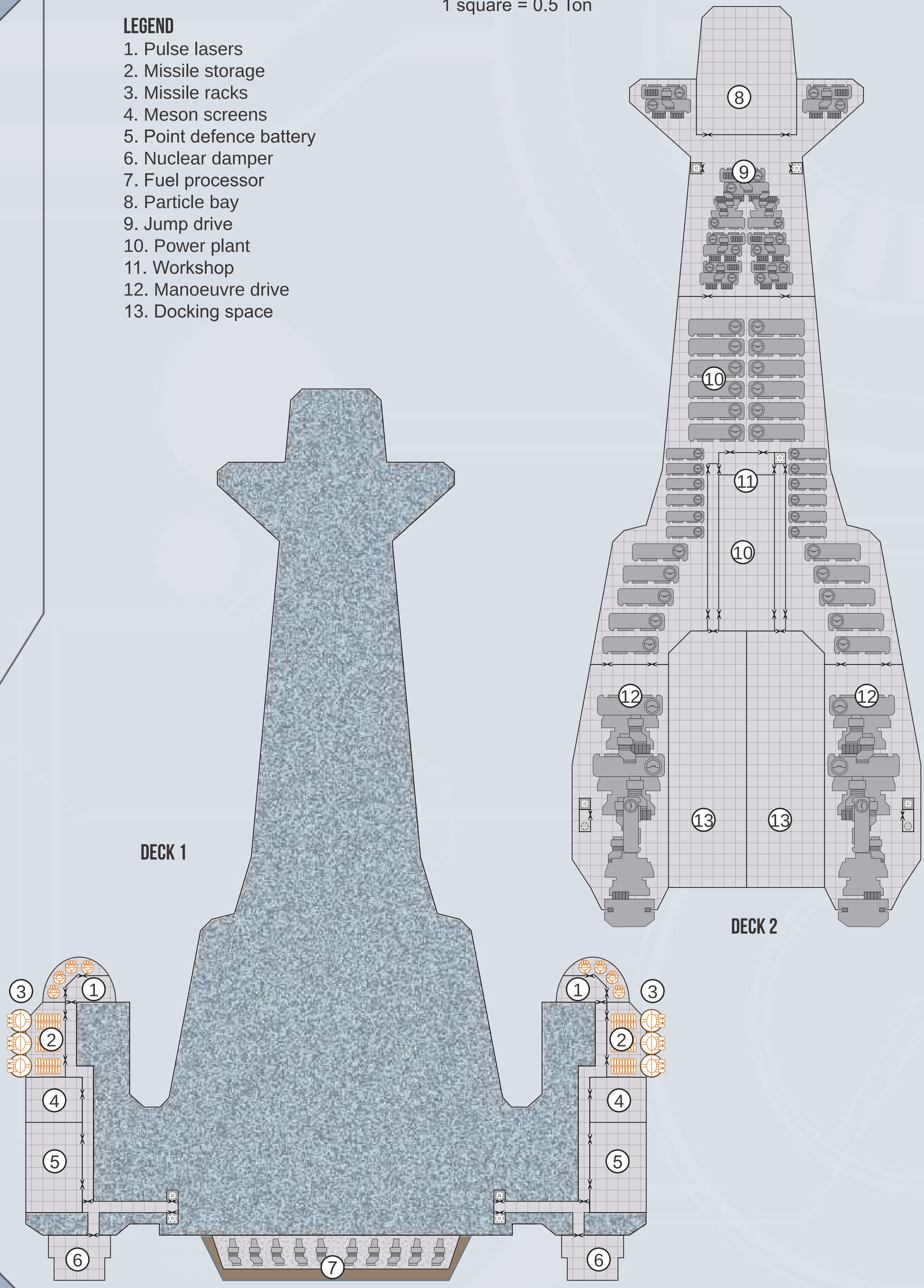
Basic Ship Systems	600
Manoeuvre Drive	1,350
Jump Drive	1,200
Sensors	9
Weapons	346
Fuel Processor	30
Systems	1

TL15		Tons	Cost (MCr)
Hull	3,000 tons, Streamlined	—	180
	Reinforced	—	90
Armour	Bonded Superdense, Armour: 4	115.2	57.6
M-Drive	Thrust 6 (energy efficient)	180	396
J-Drive	Jump-4	305	457.5
Power Plant	Fusion (TL15), Power 3,540	177	354
Fuel Tanks	J-4, 8 weeks of operation	1,236	—
Bridge	Holographic Controls	60	18.75
Computer	Core/70fib	—	120
Sensors	Advanced	5	5.3
	Countermeasures Suite	2	4
	Enhanced Signal Processing	2	8
Weapons	Small Particle Beam Bay	50	20
	Triple Turrets (missile racks) x6	6	19.5
	Triple Turrets (pulse lasers) x8	8	32
	Triple Turrets (sandcasters) x6	6	10.5
	Point Defence Laser Batteries (Type III) x2	40	40
Ammunition	Missile Storage (288 missiles)	24	—
	Sandcaster Canister Storage (480 canisters)	24	—
Screens	Meson Screens x2	20	40
	Nuclear Dampers x4	40	40
Craft	Docking Spaces (40 tons) x2	88	22
	Pinnaces x 2	—	19.36
Systems	Fuel Processor (600 tons/day)	30	1.5
	Fuel Scoops	—	—
	Armoury	5	1.25
	Briefing Room	4	0.5
	Medical Bay	4	2
	Repair Drones	30	6
	Workshop	6	0.9
Staterooms	Standard x96	384	48
Software	Manoeuvre	—	—
	Intellect	—	—
	Jump Control/4	—	—
	Library	—	—
	Advanced Fire Control/1	—	12
	Anti-Hijack/2	—	8
	Auto-Repair/1	—	5
	Broad Spectrum EW	—	14
	Evade/1	—	1
	Point Defence/2	—	12
Common Areas		96	9.6
Cargo		52.8	—
Total: MCr2056.26			

1 square = 0.5 Ton

LEGEND

1. Pulse lasers
2. Missile storage
3. Missile racks
4. Meson screens
5. Point defence battery
6. Nuclear damper
7. Fuel processor
8. Particle bay
9. Jump drive
10. Power plant
11. Workshop
12. Manoeuvre drive
13. Docking space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1 square = 0.5 Ton

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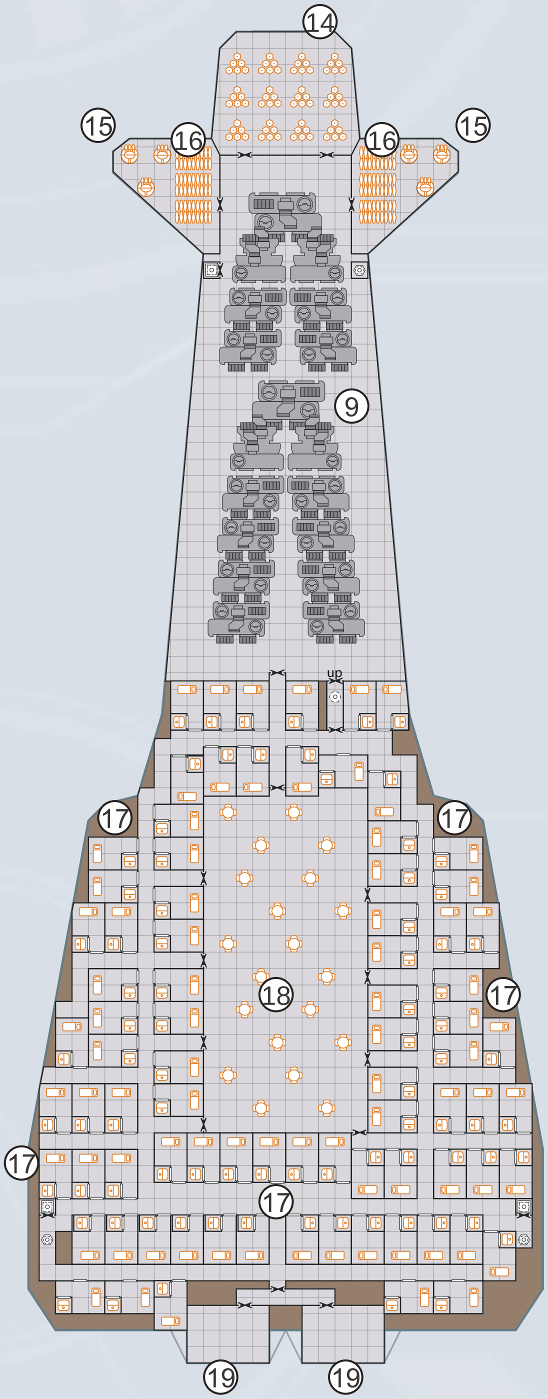
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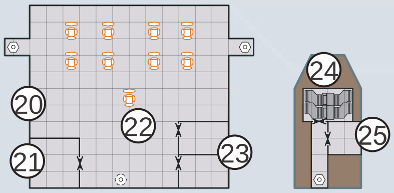
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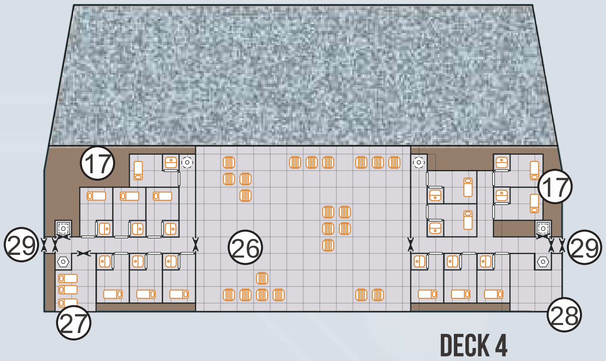
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DECK 4

LEGEND

9. Jump drive
14. Repair drones
15. Sandcaster turrets
16. Ammunition storage
17. Staterooms
18. Common area
19. Nuclear damper
20. Countermeasures suite
21. Briefing room
22. Bridge
23. Offices
24. Sensors
25. Enhanced signal processing
26. Cargo hold
27. Medbay
28. Armoury
29. Airlock

CLASS: P.F. SLOAN

The *P. F. Sloan* fleet escort is intended for routine fleet security and support. Fleet escorts are assigned in quantity for local or system defence any time several squadrons or a fleet are present.

P.F. SLOAN FLEET ESCORT

Crew

Captain, Pilots x3, Small Craft Pilots x3, Astrogator, Engineers x28, Maintenance x9, Medic, Gunners x51, Administrators x4, Officers x11, Sensops x2

Hull: 2,000

Running Costs

MAINTENANCE COST

Cr246483/month

PURCHASE COST

MCr2957.796

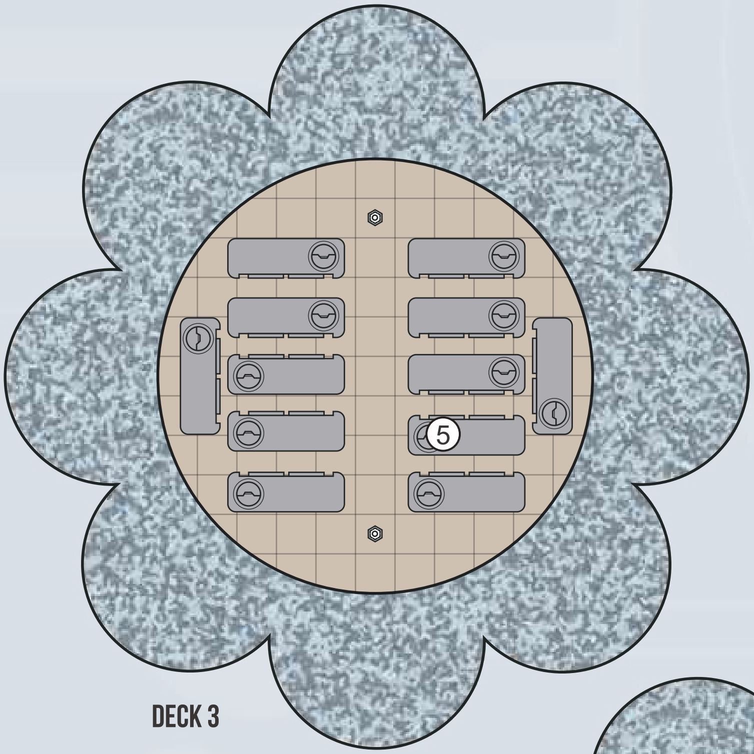
Power Requirements

Basic Ship Systems	1,000
Manoeuvre Drive	3,000
Jump Drive	2,000
Sensors	9
Weapons	460
Screens	100
Fuel Processor	50
Medical Bays	1

TL15		Tons	Cost (MCr)
Hull	5,000 tons, Standard	—	250
Armour	Bonded Superdense: 15	600	300
	Radiation Shielding	—	125
M-Drive	Thrust 6	300	600
J-Drive	Jump 4	505	757.5
Power Plant	Fusion (TL15), Power 6,750	337.5	675
Fuel Tanks	J-4, 8 weeks of operation	2068	—
Bridge	Holographic Controls	60	31.25
Computer	Core/70fib	—	120
Sensors	Advanced	5	5.3
	Enhanced Signal Processing	2	8
	Countermeasures Suite	2	4
Weapons	Small Missile Bays x2	100	24
	Triple Turrets (beam lasers) x30	30	75
	Point Defence Laser Batteries (Type III) x2	40	40
Ammunition	Missile Storage (240 missiles)	20	—
Screens	Meson Screens x2	20	40
	Nuclear Dampers x2	20	20
Craft	Docking Spaces (50 tons) x3	165	41.25
	Modular Cutters x3	0	35.79
Systems	Armoury	5	1.25
	Briefing Room	4	0.5
	Fuel Processor (1,000 tons/day)	50	2.5
	Fuel Scoops	—	1
	Medical Bay	4	2
	Repair Drones	50	10
	Workshop	6	0.9
Staterooms	Standard x77	308	38.5
Software	Advanced Fire Control/2	—	15
	Anti-Hijack/2	—	8
	Auto-Repair/1	—	5
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Evade/1	—	1
	Point Defence/2	—	12
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		77	7.7
Cargo		221.5	—
Total: MCr3286.44			

1 square = 5 Tons

LEGEND
1. Manoeuvre drive
2. Nuclear damper
3. Meson screen
4. Jump drive
5. Power plant



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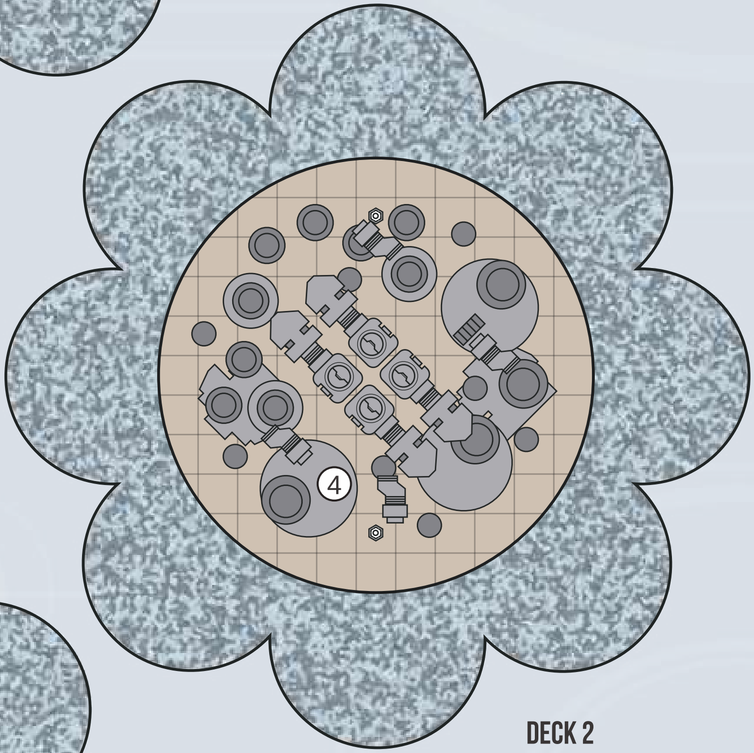

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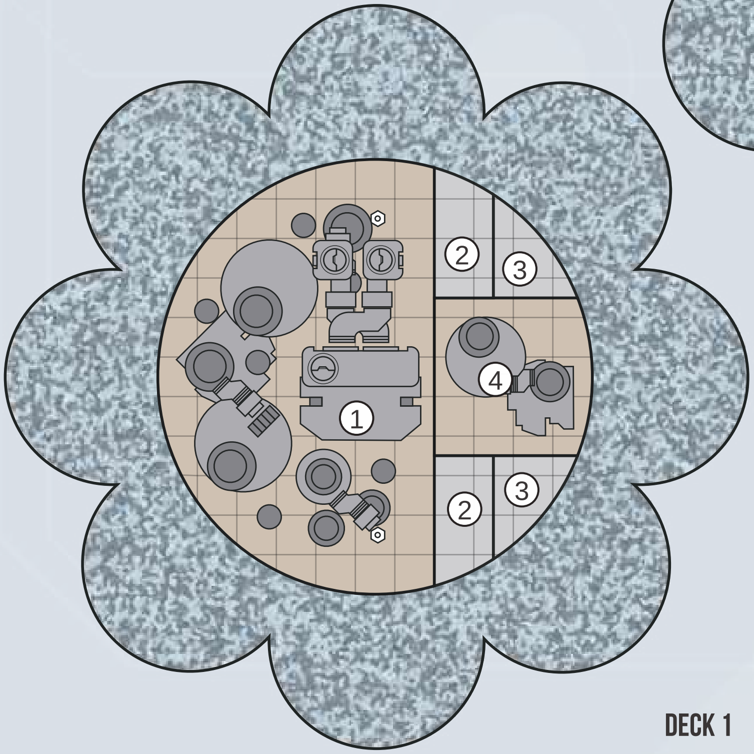
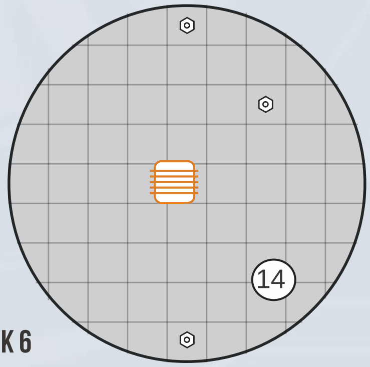


DECK 1

1 square = 5 Tons

LEGEND

6. Power plant
7. Staterooms
8. Docking space
9. Common area
10. Fuel processor
11. Briefing room, armoury, medbay and workshop
12. Airlock
13. Drones
14. Cargo hold
15. Missile bay
16. Missile storage
17. Point defence battery
18. Beam laser turrets
19. Bridge
20. Sensors



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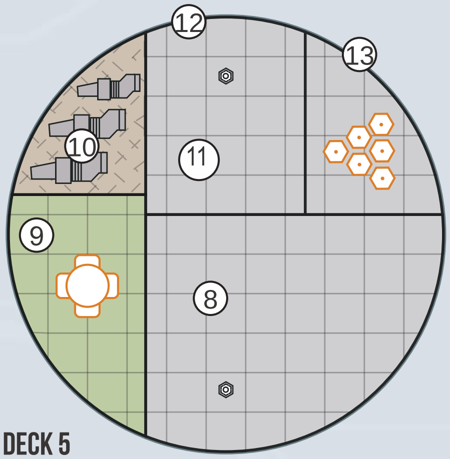
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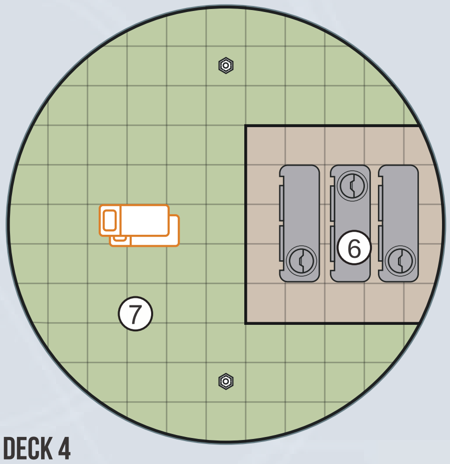

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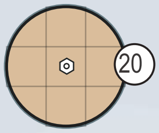

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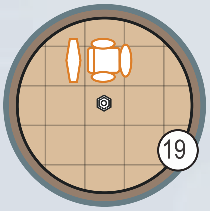

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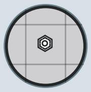

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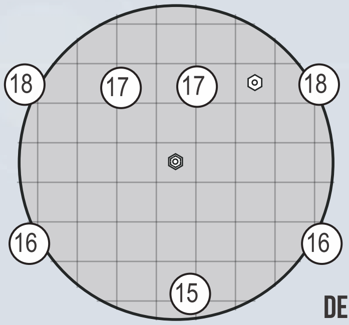
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DECK 7

LIGHT CARRIER

CLASS: SKIMKISH

The *Skimkish* light carrier is relatively slow fighter carrier/tender characterised by a variety of heterogeneous weaponry and a large complement of heavy fighters. Despite its low Thrust, the ship is a workman-like machine with a tough armour shell that enables it to stay in the fight long enough to collect all of its deployed fighters.

The Imperial Navy does not emphasise carriers as ships that decide battles, instead pairing carriers with assault and battle squadrons, along with fleet tenders. Fighters screen the launching and recovery of battle riders, while the battle riders themselves, along with cruisers and dreadnoughts, are used to destroy enemy ships of the line; the fighters then ensure they survive recovery operations.

TL15		Tons	Cost (MCr)
Hull	29,000 tons, Standard	—	1450
	Reinforced	—	725
	Radiation Shielding	—	725
Armour	Bonded Superdense: 15	3,484	1740
M-Drive	Thrust 2	580	1160
J-Drive	Jump 4	2,905	4357.5
Power Plant	Fusion (TL15), Power 18,400	920	1840
Fuel Tanks	J-4, 8 weeks of operation	11,784	—
Bridge		60	145
Computer	Core/60	—	75
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Countermeasures Suite	2	4
Weapons	Large Meson Gun Bay (Size Reduction x2)	400	312.5
	Triple Turrets (missile racks) x50	50	162.5
	Triple Turrets (beam lasers) x50	50	125
	Triple Turrets (sandcasters) x50	50	87.5
	Double Turrets (fusion guns) x50	50	225
	Single Turrets (particle beams) x50	50	210
	Point Defence Laser Batteries (Type III) x4	80	80
Ammunition	Missile Storage (1,500 missiles)	125	—
	Sandcaster Canister Storage (1,500 canisters)	75	—
Screens	Nuclear Damper	90	90
Craft	Docking Spaces (50 tons) x77	4,235	1058.75
	Full Hangars (50 tons) x3	300	60
	Heavy Fighters x80	—	6126.4
Systems	Armoury	28	7
	Briefing Rooms x12	48	6
	Fuel Processor (3,000 tons/day)	150	7.5
	Fuel Scoops	—	1
	Launch Tube	500	250
	Medical Bays x6	24	12

Crew

Captain, Pilots x3, Fighter Pilots x80, Astrogator, Engineers x108, Maintenance x44, Medics x5, Gunners x352, Administrators x19, Officers x61, Sensops x6

Hull: 15,950

Running Costs

MAINTENANCE COST

MCr1.622/month

PURCHASE COST

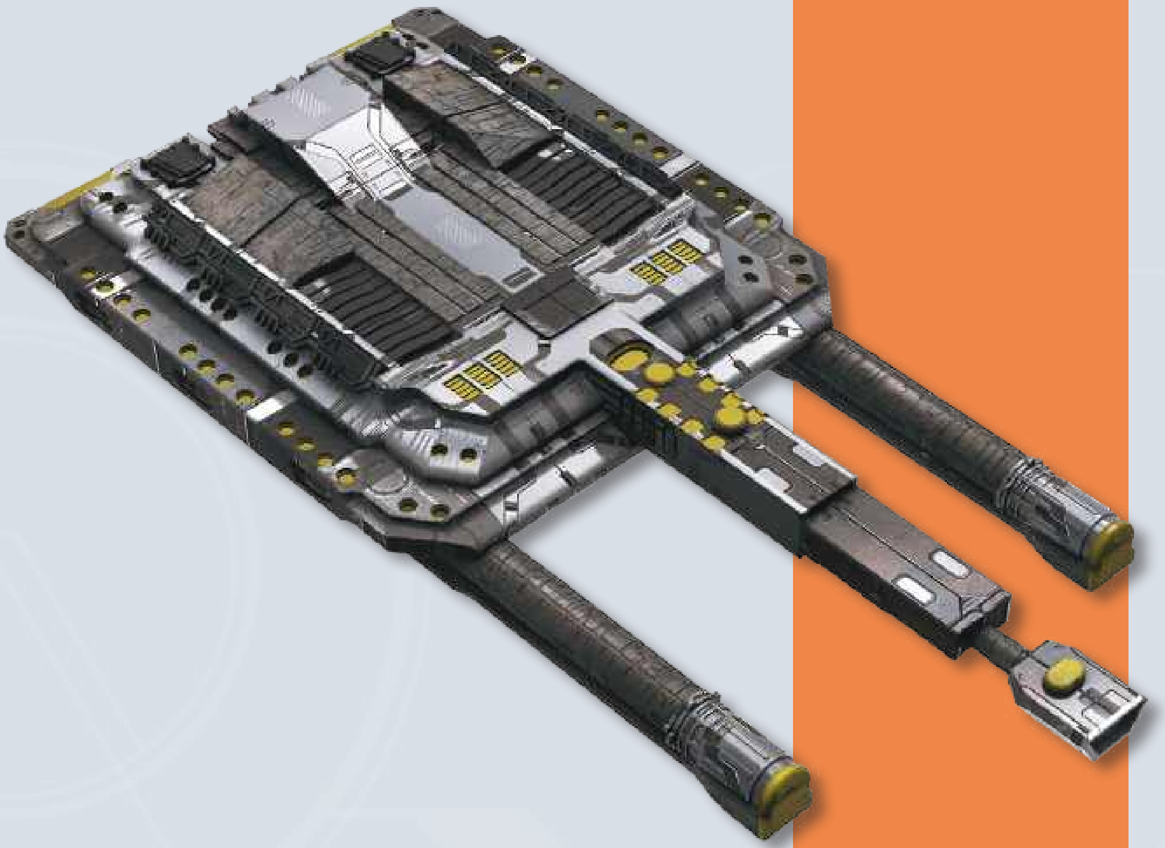
MCr19463.355

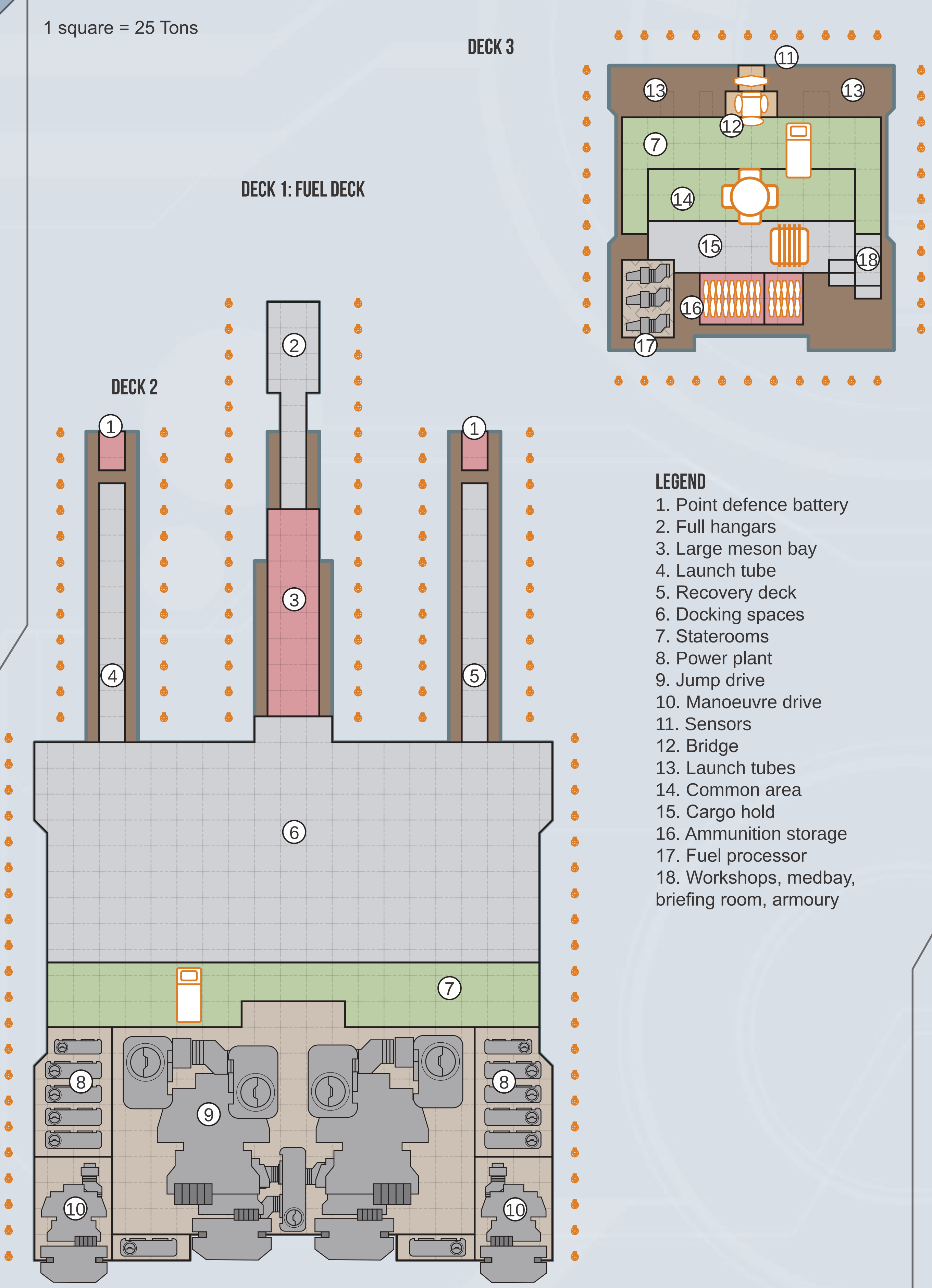
Power Requirements

Basic Ship Systems	5,800
Manoeuvre Drive	5,800
Jump Drive	11,600
Sensors	14
Weapons	3,090
Screens	180
Fuel Processor	150
Launch Tube	500
Medical Bays	6
Recovery Deck	500

Systems	Recovery Deck	500	250
	Workshops x6	36	5.4
Staterooms	Standard x420	1,680	210
	High	6	0.8
Software	Advanced Fire Control/2	—	15
	Anti-Hijack/1	—	8
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Evade/2	—	2
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		427	42.7
Cargo		305	—
Total: MCr21625.95			

SKIMKISH LIGHT CARRIER




1 square = 25 Tons
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LEGEND

1. Point defence battery
2. Full hangars
3. Large meson bay
4. Launch tube
5. Recovery deck
6. Docking spaces
7. Staterooms
8. Power plant
9. Jump drive
10. Manoeuvre drive
11. Sensors
12. Bridge
13. Launch tubes
14. Common area
15. Cargo hold
16. Ammunition storage
17. Fuel processor
18. Workshops, medbay, briefing room, armoury

LIGHT CRUISER

CLASS: VALIANT

The *Valiant* light cruiser is a recently introduced armoured version of a previous class of ships called the *Gionetti*, which was named exclusively for posthumous recipients of the Imperial Starburst for Extreme Heroism. The *Gionetti* was capable of jump-5 but its non-existent armour made it a liability in fleet actions. The running joke was that its crews would soon be 'posthumous' as well.

The ship is currently in favour as a flagship for minor operations and it includes a command bridge for the purpose of leading a squadron of destroyers and destroyer escorts.

VALIANT
LIGHT CRUISER

Crew

Captain, Pilots x3, Small Craft Crew x5, Astrogator, Engineers x101, Mechanics x40, Marines x20, Medics x3, Gunners x203, Administrators x20, Officers x40, Sensops x8

Hull: 16500

Running Costs

MAINTENANCE COST

MCr1.556925/month

PURCHASE COST

MCr18683.1

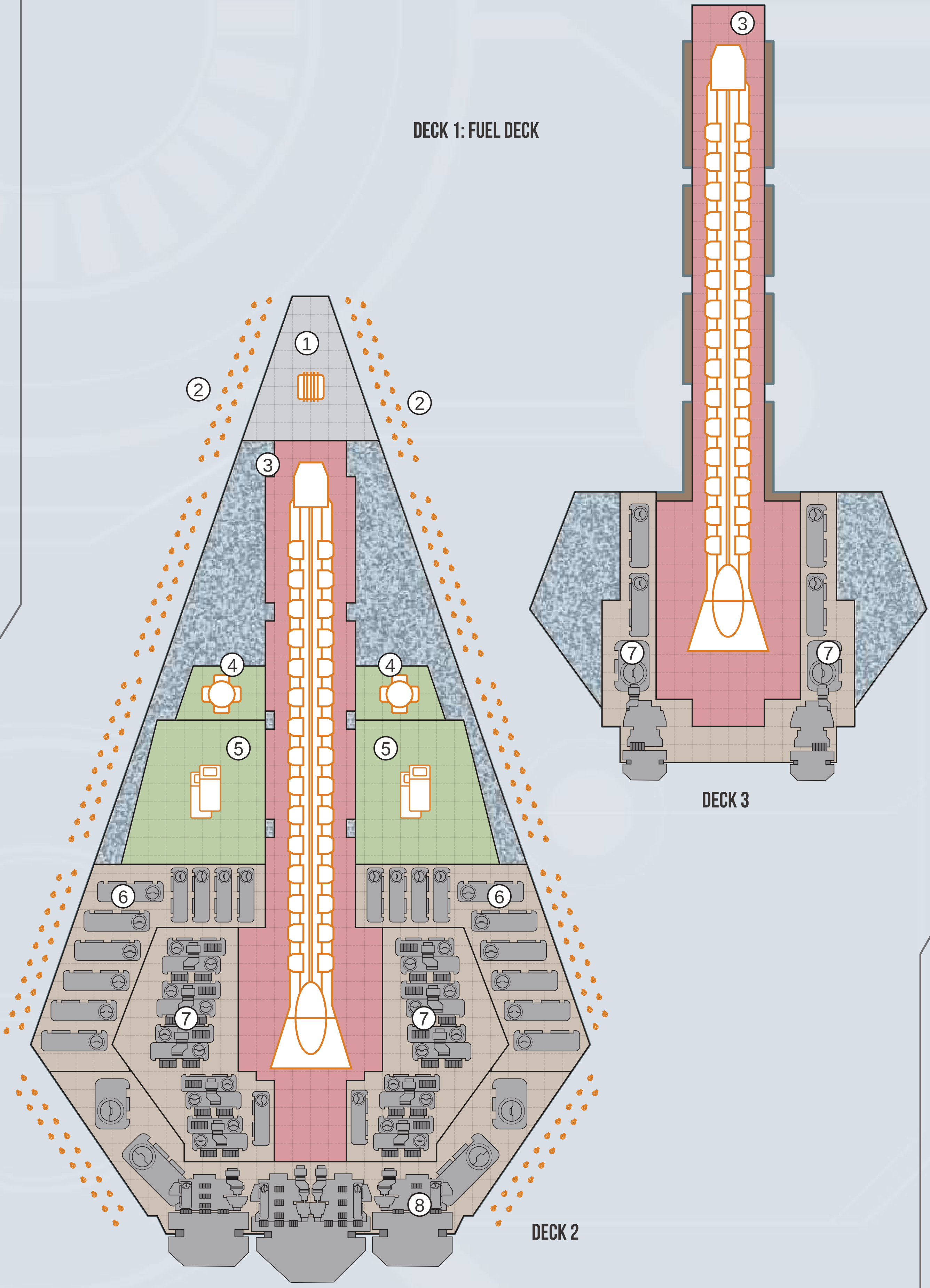
Power Requirements

System	Power
Basic Ship Systems	6,000
Manoeuvre Drive	15,000
Jump Drive	12,000
Sensors	22
Weapons	2015
Screens	180
Fuel Processor	50
Medical Bay	4

TL15		Tons	Cost (MCr)
Hull	30,000 tons, Standard	—	1500
	Reinforced	—	750
Armour	Bonded Superdense: 15	3,600	1800
	Radiation Shielding	—	750
M-Drive	Thrust 5 (size reduction x3)	1,050	4500

TL15		Tons	Cost (MCr)
J-Drive	Jump 4 (decreased fuel)	3,005	4958.25
Power Plant	Fusion (TL15), Power 24,000	1,200	2400
Fuel Tanks	J-4, 8 weeks of operation	11,640	—
Bridge	Holographic Controls	60	187.5
	Command Bridge	40	30
Computer	Core/100fib	—	195
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	6,000	2600
	Medium Repulsor Bay	100	60
	Triple Turrets (missile racks) x160	160	520
	Triple Turrets (beam lasers) x50	50	187.5
	Triple Turrets (sandcasters) x25	25	43.75
	Point Defence Laser Batteries (Type II) x4	80	40
Ammunition	Missile Storage (9,600 missiles)	800	—
	Sandcaster Canisters Storage (1,320 canisters)	66	—
Screens	Nuclear Dampers (size reduction x3) x9	63	135
Craft	Docking Spaces (50 tons) x5	275	68.75
	Modular Cutters x5	—	59.65
Systems	Armoury	18	4.5
	Briefing Rooms x2	8	1
	Fuel Processor (1,000 tons/day)	50	2.5
	Fuel Scoops	—	1
	Medical Bays x4	16	8
	Workshops x2	12	1.8
Staterooms	Standard x265	1,060	132.5
	High	6	0.8
Software	Advanced Fire Control/2	—	15
	Anti-Hijack/3	—	10
	Battle System/2	—	24
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Launch Solution/3	—	16
	Point Defence/2	—	12
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		267	26.7
Cargo		317	—
Total: MCr20759			

1 square = 10 Tons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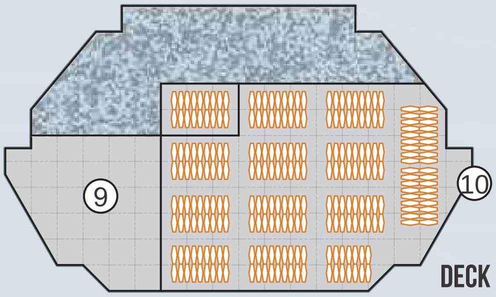
DECK 2

1 square = 10 Tons

LEGEND

1. Cargo hold
2. Turrets
3. Spinal mount
4. Common areas
5. Staterooms
6. Power plant
7. Jump drive
8. Manoeuvre drive
9. Docking space
10. Ammunition storage
11. Systems, including fuel processor
12. Repulsor
13. Bridge
14. Nuclear dampers
15. Point defence battery
16. Sensors



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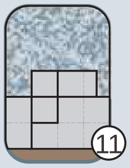

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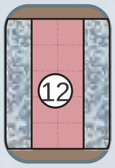

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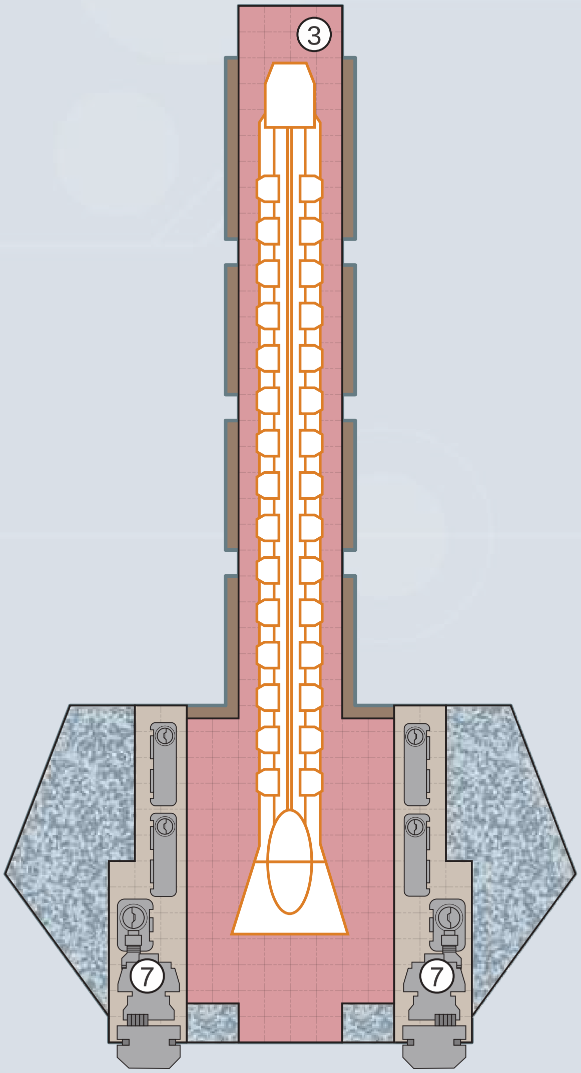
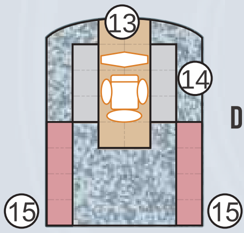


DECK 3



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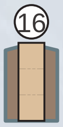


DECK 8

ARMOURED CRUISER

CLASS: GHALALK

The *Ghalalk* armoured cruiser is a basic fleet workhorse, undertaking a wide variety of duties in peacetime and supporting the battle fleets in war. The 200 marines carried aboard the *Ghalalk* constitute a reinforced company, trained in protected forces operations and capable of orbital assaults via the included troop transports, if called upon. A command bridge and extra staterooms are included, allowing ships of this class to act as flagships for small fleets on occasion.

The *Ghalalk* is part of a family of cruisers that mount interchangeable 2,600-ton 'pods' that provide greater versatility. The *Ghalalk* mounts four of these pods and this example includes a typical loadout of four identical missile pods.

Crew

Captain, Pilots x3, Astrogator, Engineers x149, Maintenance x50, Gunners x188, Administrators x25, Sensops x8, Troop Transport Crew x8, Officers x42, Medics x6, Stewards x3, Troops x200, Frozen Watch x200

Hull: 27,500

Running Costs

MAINTENANCE COST

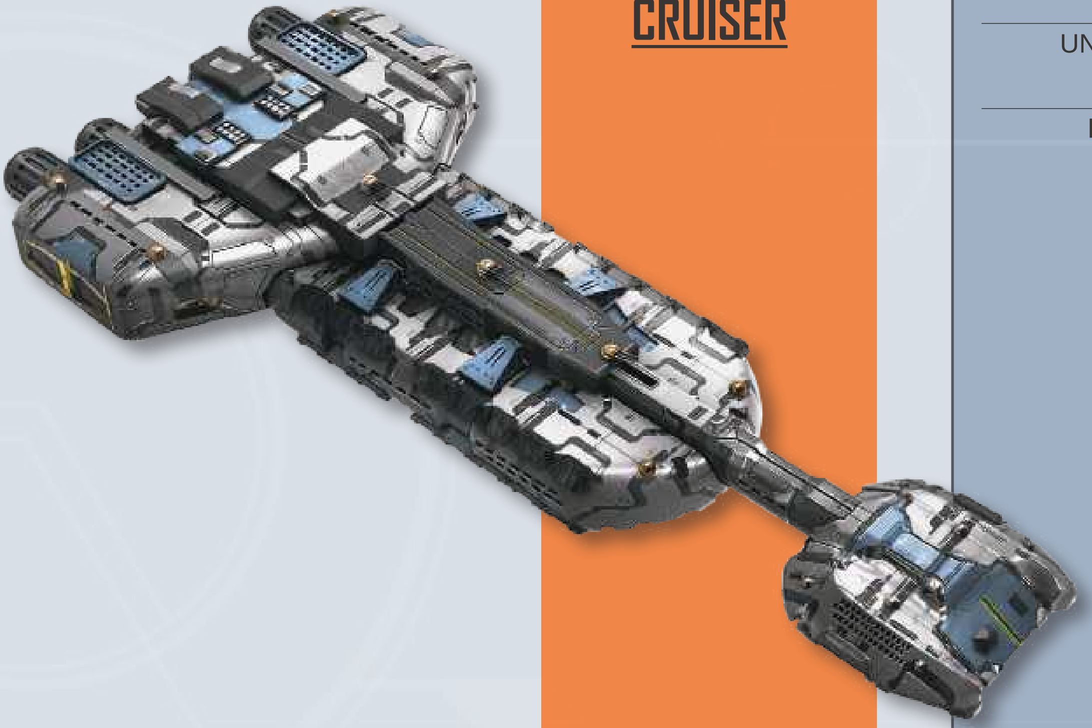
MCr2.928/month

PURCHASE COST

MCr35133.8895

Power Requirements

Basic Ship Systems	10,000
Manoeuvre Drive	22,500
Jump Drive	20,000
Sensors	44
Weapons	2444
Screens	500
Fuel Processor	200
Medical Bays	6
UNREP System	10
Low Berths	20



GHALALK ARMOURED CRUISER

ARMOURED CRUISER

CLASS: GHALALK

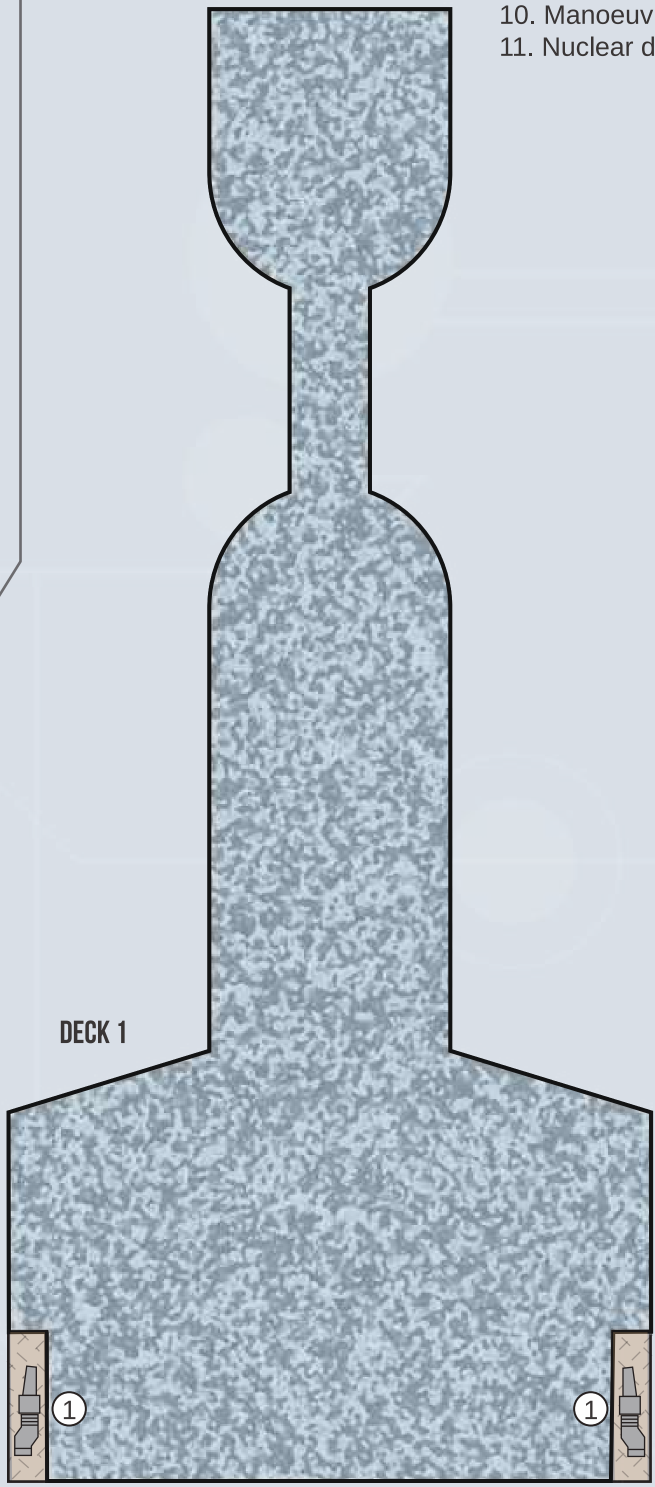
TL15		Tons	Cost (MCr)
Hull	50,000 tons, Standard	—	2500
	Reinforced	—	1250
	Military	—	625
	Modular Hull (10,400 tons)	—	520
Armour	Bonded Superdense, Armour: 17	6,800	3400
	Radiation Shielding	—	1250
M-Drive	Thrust 6 (energy efficient, reduced size x2)	2,400	9000
J- Drive	Jump 4 (reduced fuel x2)	5,005	9384.375
Power Plant	Fusion (TL15), Power 60,000	3,000	6000
Fuel Tanks	J-4, 8 weeks of operation	18,600	—
Bridge	Bridges x2, Holographic Controls	120	625
	Command Bridges x2, Holographic Controls	80	60
Computer	Core/100fib	—	195
Backup	Core/90fib	—	180
Sensors	Advanced x2	10	10.6
	Distributed Arrays x2	20	21.2
	Military Countermeasures Suites x2	30	56
	Enhanced Signal Processing x2	4	16
Weapons	Particle Accelerator Spinal Mount (TL 14)	2,800	1300
	Triple Turrets (accurate, high yield beam lasers) x68	68	255
	Triple Turrets (sandcasters) x20	20	35
	Fusion Barbettes (long range, high yield) x12	60	72
	Medium Missile Bays (size reduction x3) x8	560	240
	Large Missile Bays (size reduction x3) x8	2,800	300
	Point Defence Laser Batteries (Type III) x2	40	40
Ammunition	Missile Storage (23,040 missiles)	1,920	—
	Sandcaster Canister Storage (800 canister)	40	—
Screens	Meson Screens x10	100	200
	Nuclear Dampers x10	100	100
Armoured Bulkheads	Manoeuvre Drive	240	48
	Jump Drive	500.5	100.1
	Power Plant	300	60
	Bridges	12	2.4
	Command Bridges	8	1.6
	Sensors	6.4	1.28
	Spinal Mount	280	56
	Medium Bays	56	11.2
	Large Bays	280	56
	Missile Storage	192	38.4
	Meson Screens	10	2
	Nuclear Dampers	10	2
Craft	Full Hangar (240 tons)	480	96
	Troop Transports x4	—	203.2

Systems	Hull Modules (2,600 tons) x4	—	260
	Fuel Processor (4,000 tons/day)	200	10
	Fuel Scoops	—	1
	Brigs x4	16	1
	Repair Drones	500	100
	Armoury	50	12.5
	Briefing Rooms x8	32	4
	Medical Bays x6	24	12
	UNREP System (200 tons/hour)	10	5
	Workshops x4	24	3.6
Software	Manoeuvre	—	—
	Intellect	—	—
	Jump Control/4	—	—
	Library	—	—
	Evade/3	—	3
	Auto-Repair/2	—	10
	Advanced Fire Control/3	—	18
	Anti-Hijack/3	—	10
	Battle System/1	—	18
	Broad Spectrum EW	—	14
	Launch Solution/3	—	16
	Point Defence/2	—	12
	Virtual Crew/0	—	1
	Virtual Gunner/0	—	1
Staterooms	Standard x 290	1,160	145
	High x 4	24	3.2
	Barracks x 200	200	10
	Low Berths x 200	100	10
Common Areas		400	40
Cargo		300.1	—
Total: MCr39037.655			

1 square = 25 Tons

LEGEND

1. Fuel processor
2. Hangar
3. Cargo hold
4. Common area
5. Staterooms
6. Medium missile bay
7. Turrets
8. Missile storage
9. Large missile bay
10. Manoeuvre drive
11. Nuclear damper



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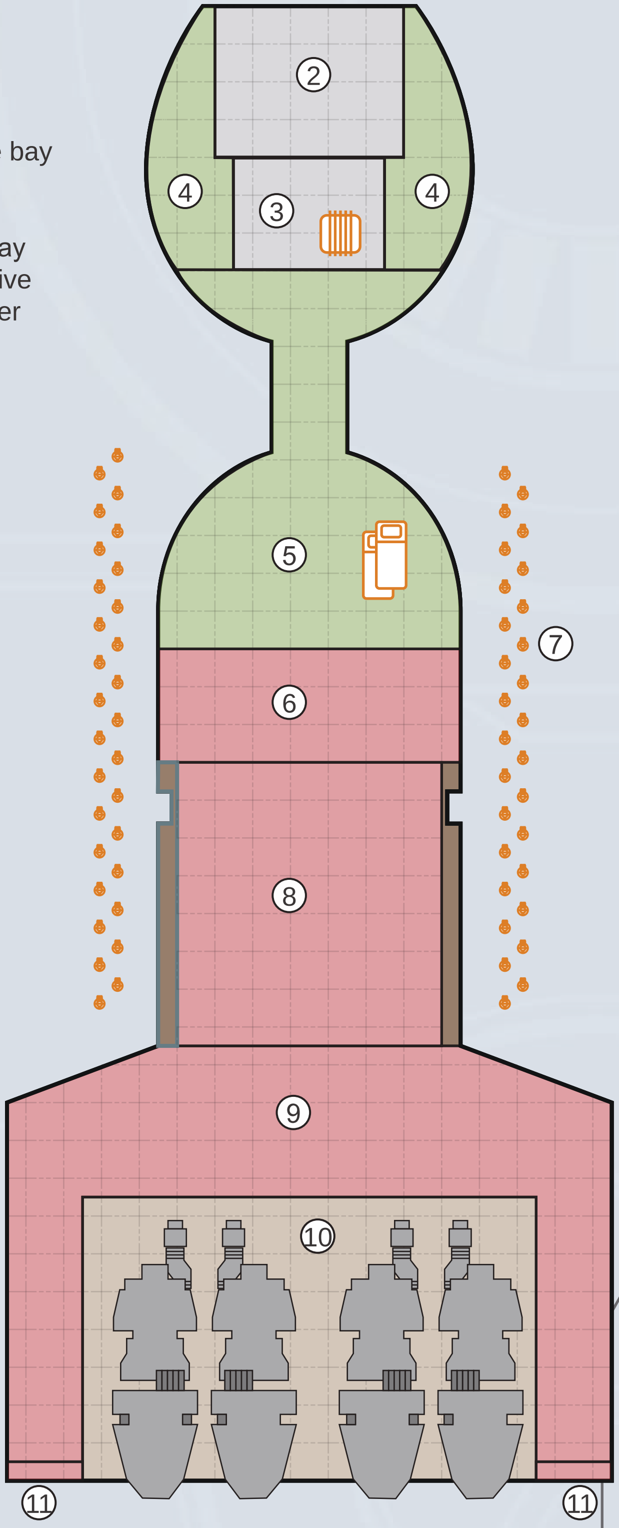
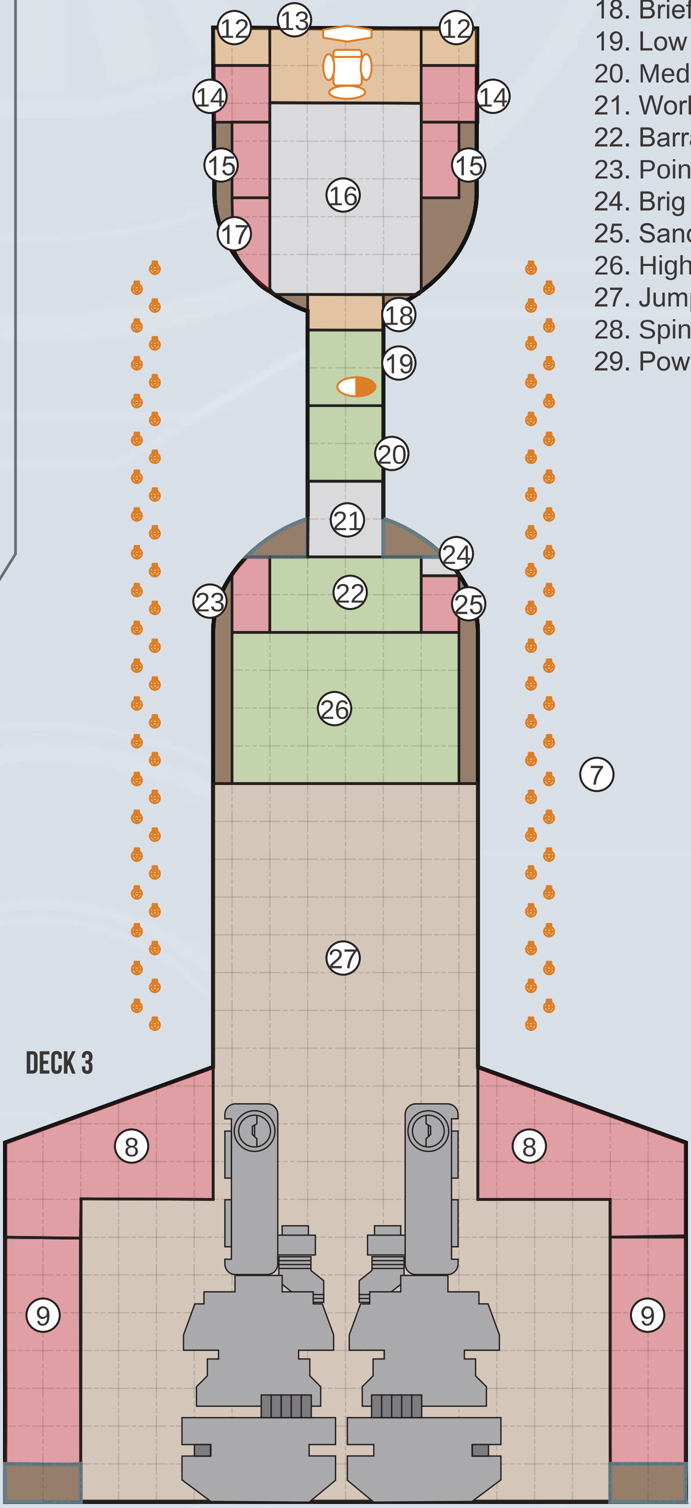


DECK 2

1 square = 25 Tons

LEGEND

7. Turrets
8. Missile storage
9. Large missile bay
12. Sensors
13. Bridge
14. Barbette
15. Meson screen
16. Drones
17. Armoury
18. Briefing room
19. Low berths
20. Medbay
21. Workshop
22. Barracks
23. Point defence battery
24. Brig
25. Sandcaster barrel storage
26. High staterooms
27. Jump drive
28. Spinal mount
29. Power plant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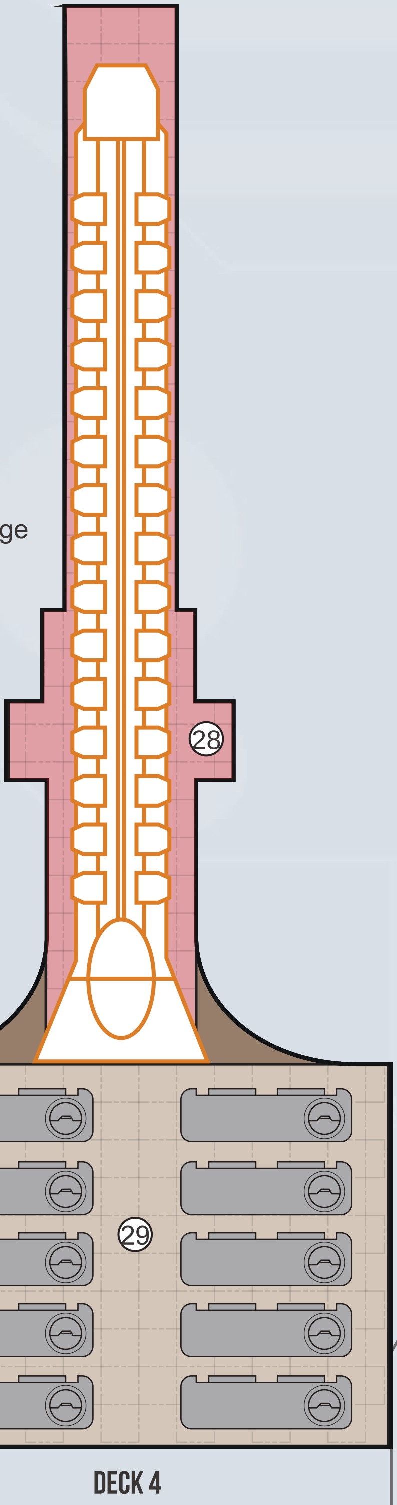


PLANETOID MONITOR

Incorporating enhanced sensors, and communications, and a new command bridge to allow oversight of all traffic in and around Mora, the *Jaellemo* stands guard over Mora, inspecting any suspect ships in detail before allowing them to proceed. An upgrade to the *Empress Troyhune*, the *Jaellemo* planetoid monitor is a mighty defender of the unofficial capital of the Spinward Marches. The *Jaellemo* was completed in 1101, replacing the *Empress Troyhune.* Travellers to the Mora system must pass under the guns of this imposing ship before being allowed to dock at the highport.

Crew

Captain, Pilots x3, Fighter Pilots x30, Engineers x70, Maintenance x34, Medics x7, Gunners x762, Fuel Refinery x3, Administrators x32, Officers x94, Pursers x3, Sensops x6

Hull: 31,250

Running Costs

MAINTENANCE COST

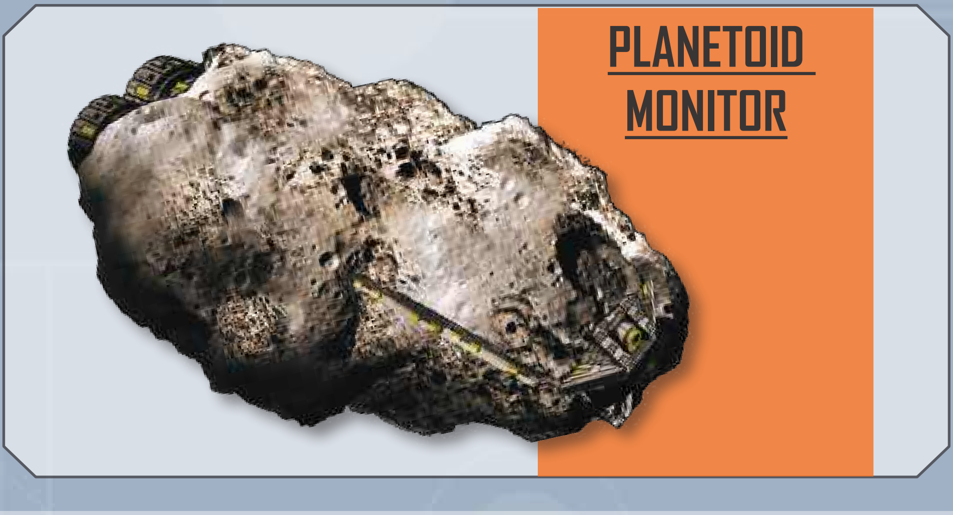
MCr2.085949/month

PURCHASE COST

MCr25031.3895

Power Requirements

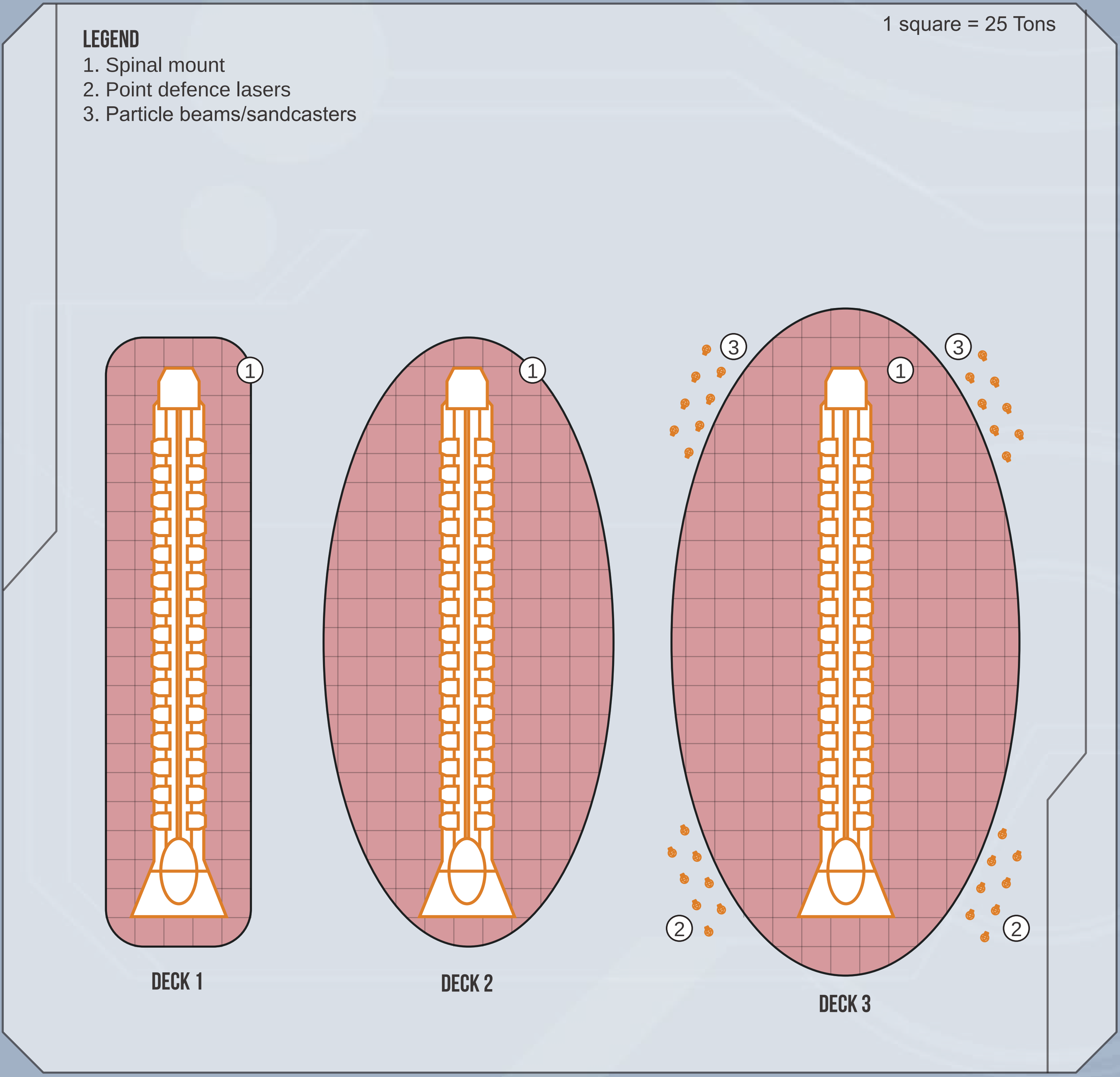
Basic Ship Systems	6,500
Manoeuvre Drive	30,000
Sensors	308
Weapons	3325
Screens	450
Fuel Processor	50
Medical Bays	5
Launch Tubes	500
Recovery Deck	500



TL15		Tons	Cost (MCr)
Hull	50,000 Buffered Planetoid	17,500	200
Armour	Bonded Superdense, Armour: 15	2860	1430
	Radiation Shielding	—	812.5
M-Drive	Thrust 6 (size reduction x3)	2,100	9000
J-Drive	—	—	—
Power Plant	Fusion (TL15), Power: 43,740	2,187	4,374
Fuel Tanks	24 weeks of operation	1,314	—
Bridge	Holographic Controls	60	203.125
	Command Bridge	40	30
Computer	Core/100fib	—	195
Backup	Core/90fib	—	180
Sensors	Advanced x3	15	15.9
	Rapid Deployment Extended Arrays	30	63.6
	Enhanced Signal Processing	2	8

Sensors	Military Countermeasures Suite	15	28
	Deep Penetration Scanners (scan 5,000 tons/hr)	250	250
	Mail Distribution Array (advanced)	20	10
Weapons	Meson Spinal Mount (TL15)	12,000	5200
	Triple Turrets (sandcasters) x100	100	175
	Triple Turrets (accurate beam lasers) x100	100	325
	Double Turrets (high yield fusion Guns) x20	20	98
	Particle Beam Barbettes (intense focus) x30	150	300
	Point Defence Laser Batteries (Type III) x15	300	300
Ammunition	Missile Storage (2,400 missiles)	200	20
	Sandcaster Canister Storage (3,000 canisters)	150	15
Screens	Meson Screens x9	90	180
	Nuclear Dampers x9	90	90
Armoured Bulkheads	Bridge	10	2
	Manoeuvre Drive	210	42
	Power Plant	218.7	43.74
	Meson Spinal Mount	1,200	240
	Missile storage	20	4
	Nuclear Damper	9	1.8
	Meson Screen	9	1.8
	Sensors	8.2	1.64
Craft	Docking Spaces (50 tons) x28	1,540	385
	Full Hangars (50 tons) x3	300	60
	Heavy Fighters x30	—	2297.1
Systems	Armoury	25	6.25
	Briefing Rooms x5	20	10
	Brig x2	8	0.5
	Fuel Processors (1,000 tons/day)	50	25
	Launch Tube	500	250
	Medical Bays x5	20	10
	Recovery Deck	500	250
	Repair Drones	325	65
	UNREP System (1,000 tons/hr)	50	25
	Workshops x3	18	2.7
Staterooms	Standard x685	2,740	342.5
	High x10	60	8
	Luxury x3	30	4.5
Software	Advanced Fire Control/3	—	18
	Anti-Hijack/3	—	10
	Auto-Repair/2	—	10
	Battle System/3	—	36
	Broad Spectrum EW	—	14
	Electronic Warfare/3	—	24
	Evade/3	—	3

Software	Launch Solution/3	—	16
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
	Screen Optimiser	—	5
	Virtual Crew/2	—	10
	Virtual Gunner/2	—	10
Common Areas		1,400	140
Cargo		1,136.1	—
Total: MCr27812.655			



LEGEND
1. Spinal mount
2. Point defence lasers
3. Particle beams/sandcasters

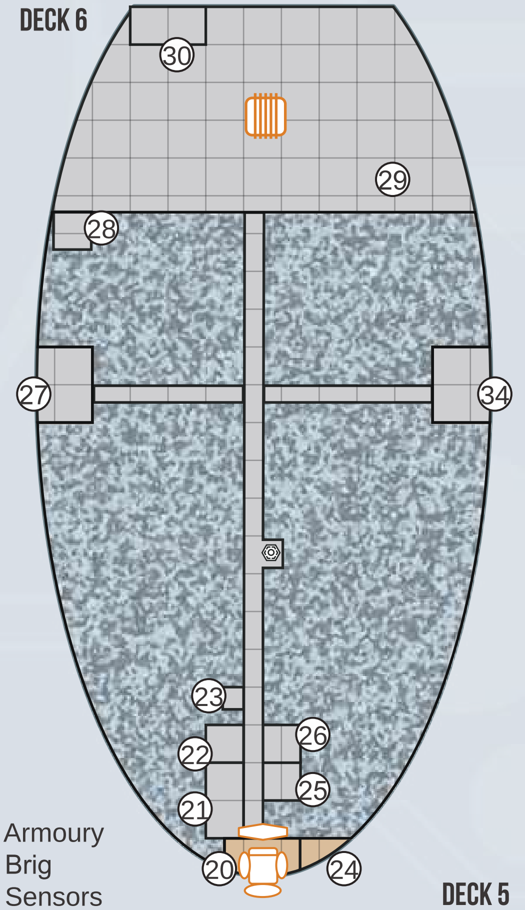
1 square = 25 Tons

LEGEND

4. Recovery deck
5. Launch tube
6. Docking space
7. Missile storage
8. Fusion guns
9. Common area
10. Triple turrets (Sandcasters)
11. Staterooms
12. Sandcaster berrels storage
13. Beam laser turrets
14. Full hangar
15. Mail distribution array
16. Repair drones
17. Deep penetration scanner
18. Power plant
19. Manoeuvre drive
20. Command bridge
21. Fuel processors

1 square = 25 Tons

DECK 6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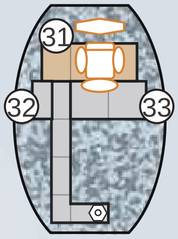
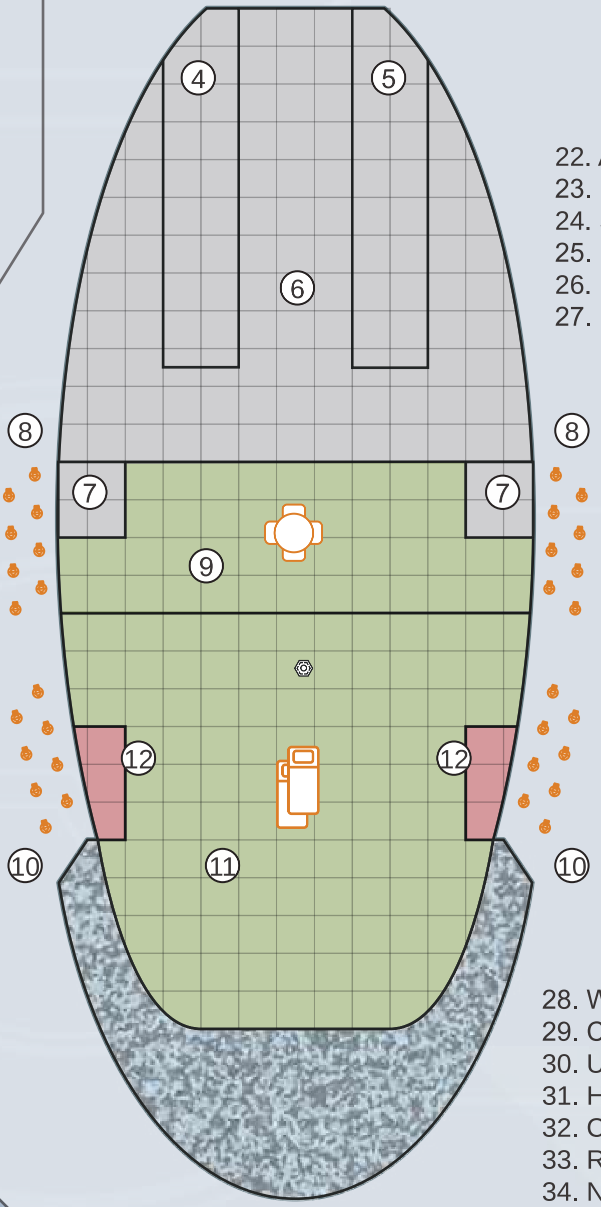


DECK 7

22. Armoury
23. Brig
24. Sensors
25. Briefing rooms
26. Medbay
27. Meson screens

DECK 4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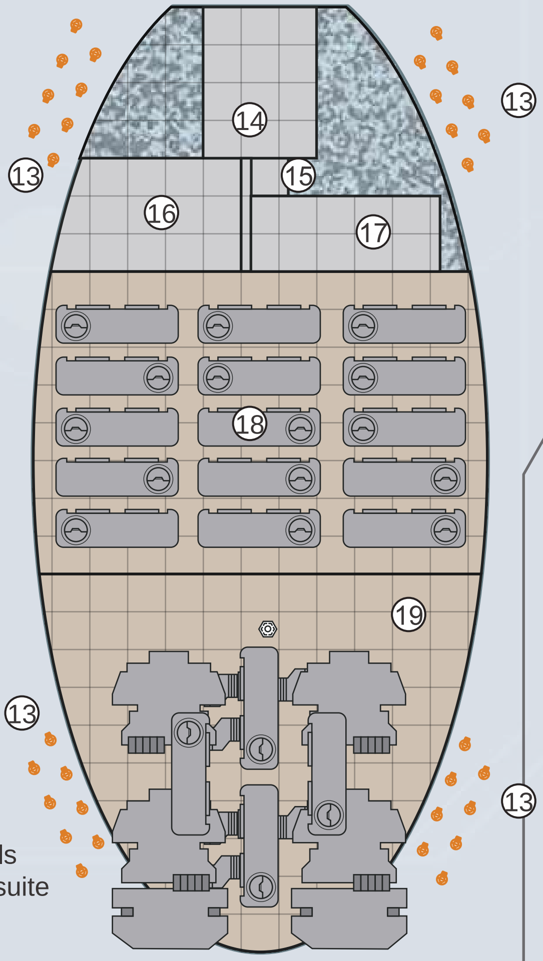
DECK 5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28. Workshop
29. Cargo hold
30. UNREP system
31. Holographic controls
32. Countermeasures suite
33. Rapid arrays
34. Nuclear dampers

STRIKE CRUISER

CLASS: ARAKOINE

Named for famous battles in Imperial history, the *Arakoine* strike cruiser is specifically designed for ground support and surface bombardment. It has large missile resources available, as well as both meson gun and particle accelerator weaponry. The ship is supported by its large phalanx of fighter craft.

These fighters are capable of close defence for the ship and of ground support in combat.

The strike cruiser is not capable of fuel skimming, relying upon its auxiliaries and escorts for the fuel scoop process. It does carry on-board fuel purification plants for the processing of fuel.

TL15		Tons	Cost (MCr)
Hull	50,000 tons, Dispersed Structure	—	1250
	Reinforced	—	625
Armour	Bonded Superdense, Armour: 3	2,400	1200
	Radiation Shielding	—	1250
M-Drive	Thrust 4	2,000	4000
J-Drive	Jump 3	3,755	5632.5
Power Plant	Fusion (TL15), Power 35,000	1,750	3500
Fuel Tanks	J-3, 8 weeks of operation	15,350	—
Bridge		60	250
Computer	Core/80fib	—	142.5
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Improved Signal Processing	1	4
	Countermeasures Suite	2	4
Weapons	Meson Spinal Mount (TL15)	12,000	5200
	Medium Orbital Strike Mass Driver Bay	100	35
	Medium Repulsor Bay	100	60
	Large Missile Bays (Size Reduction x3) x4	2,000	480
	Triple Turrets (beam lasers) x40	40	100
	Triple Turrets (sandcasters) x20	20	35
Ammunition	Missile Storage (2,400 missiles)	200	—
	Sandcaster Canister Storage (2,000 canister)	100	—
	Mass Driver Ammunition (150 shots)	1,600	—
Screens	Meson Screens x9	90	180
	Nuclear Dampers x9	90	90
Craft	Docking Spaces (50 tons) x98	5,390	1347.5
	Full Hangars (50 tons) x2	200	40
	Heavy Fighters x100	—	7658
Systems	Armoury	22	5.5
	Briefing Rooms x12	48	6
	Fuel Processor (2,000 tons/day)	100	5
	Launch Tubes x2	500	250
	Medical Bays x5	20	10
	Recovery Decks x2	500	250
	Workshops x6	36	5.4

Crew

Captain, Pilots x3, Fighter Pilots x100, Astrogator, Engineers x130, Maintenance x55, Medics x5, Gunners x132, Administrators x25, Officers x50, Sensops x9

Hull: 24,750

Running Costs

MAINTENANCE COST

MCr2.554995/month

PURCHASE COST

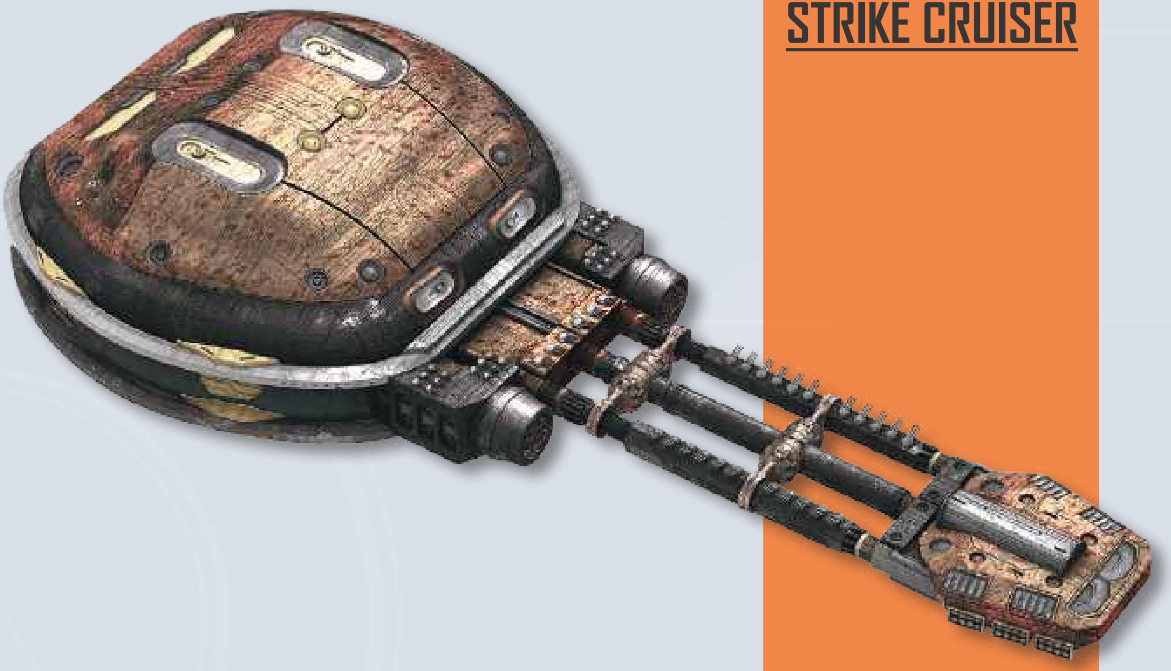
MCr30659.94

Power Requirements

Basic Ship Systems	10,000
Manoeuvre Drive	20,000
Jump Drive	15,000
Sensors	20
Weapons	2,770
Screens	450
Fuel Processor	100
Launch Tubes	200
Medical Bays	5
Recovery Decks	200

Staterooms	Standard x320	1,340	167.5
	High	6	0.8
Software	Advanced Fire Control/3	—	18
	Anti-Hijack/3	—	10
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Launch Solution/3	—	16
	Jump Control/3	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		325	32.5
Cargo		500	—
Total: MCr34066.6			

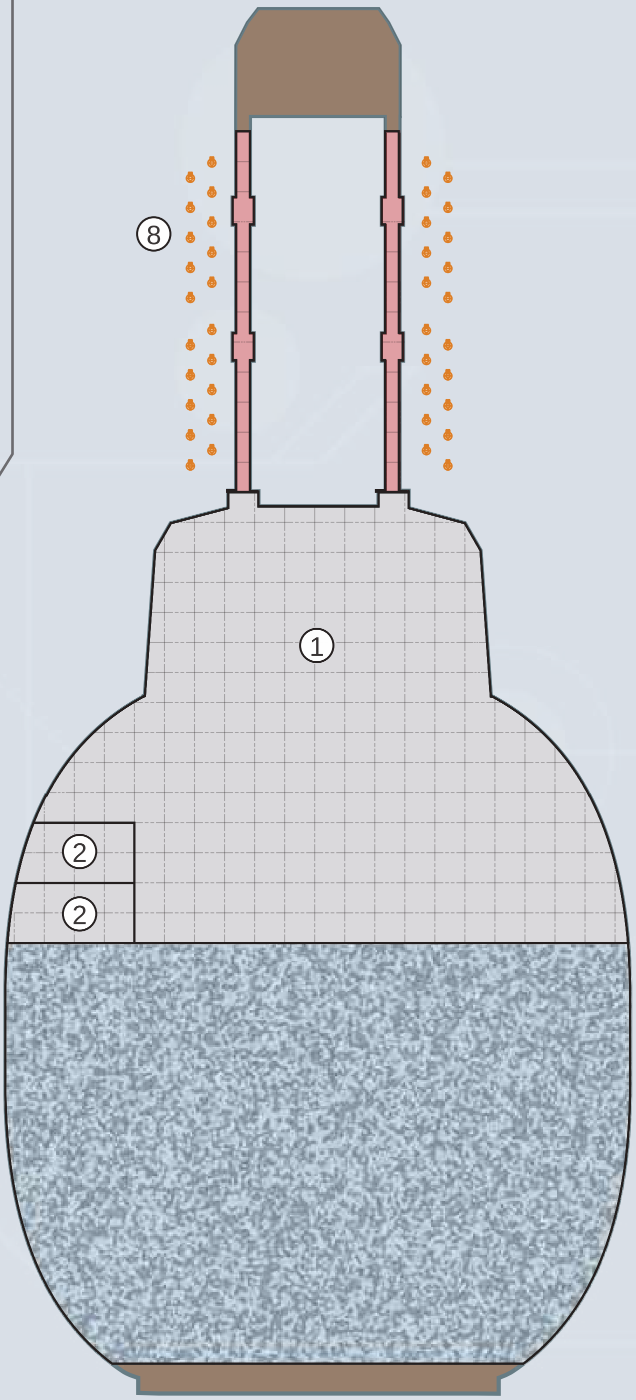
ARAKOINE STRIKE CRUISER



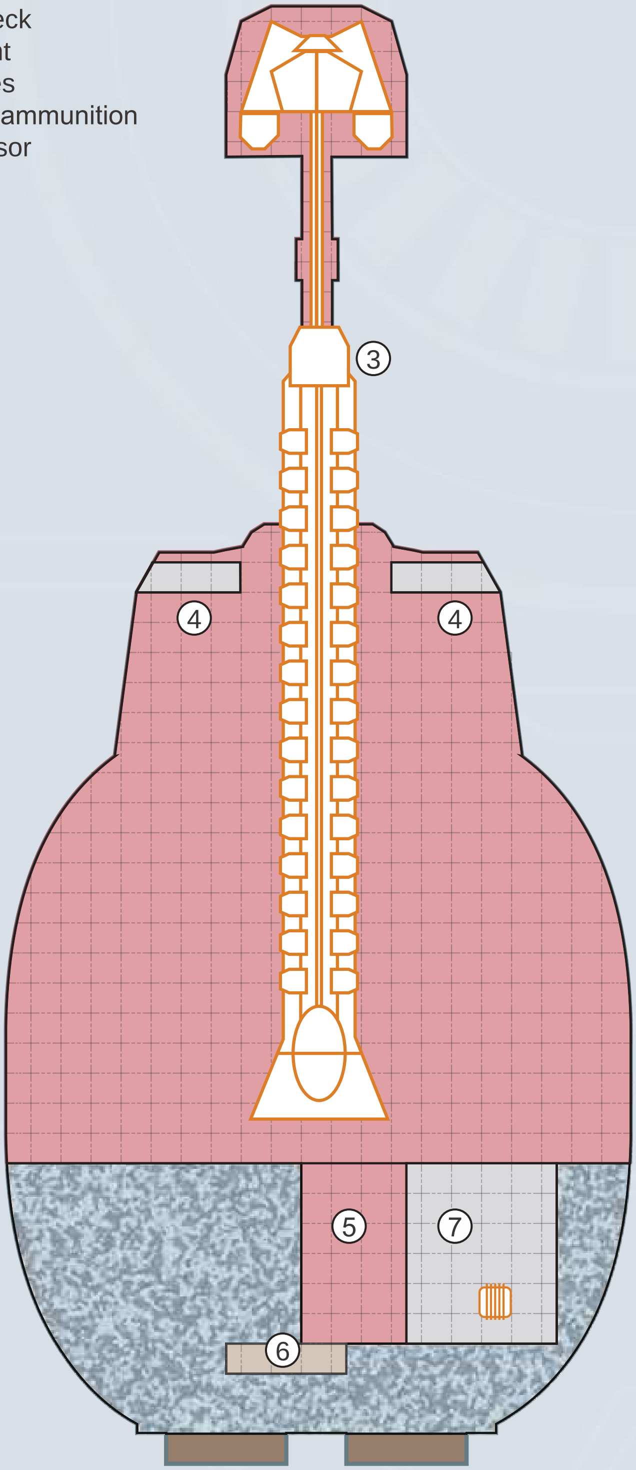
LEGEND

1. Docking space
2. Recovery deck
3. Spinal mount
4. Launch tubes
5. Mass driver ammunition
6. Fuel processor
7. Cargo hold
8. Turrets

1 square = 25 Tons



DECK 1

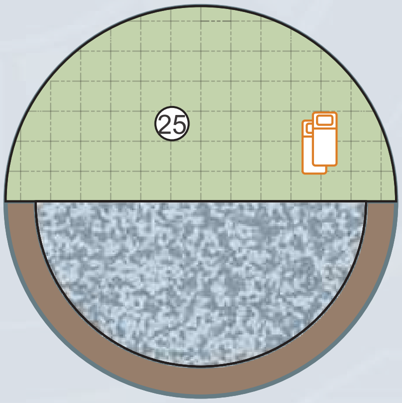


DECK 2

1 square = 25 Tons

LEGEND

1. Docking space
2. Recovery deck
3. Spinal mount
4. Launch tubes
5. Mass driver ammunition
6. Fuel processor
7. Cargo hold
8. Turrets
9. Meson screen



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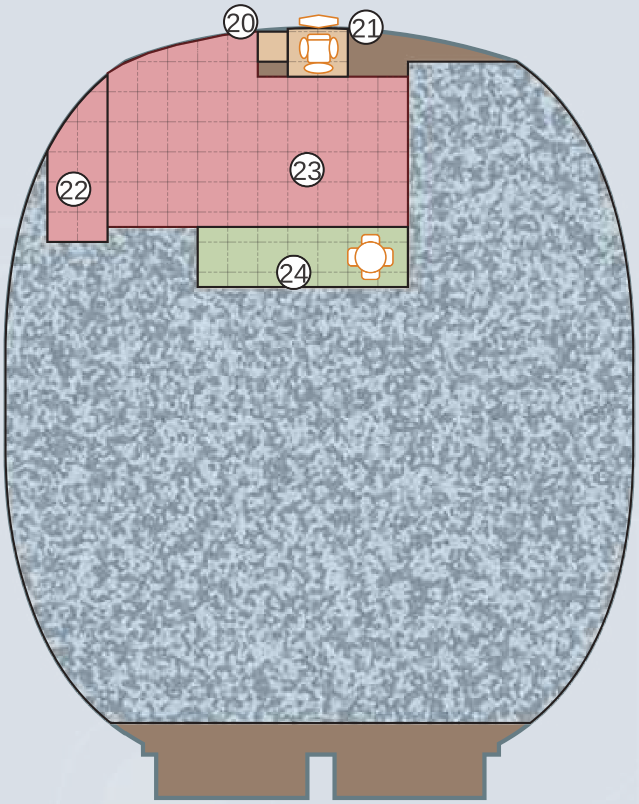

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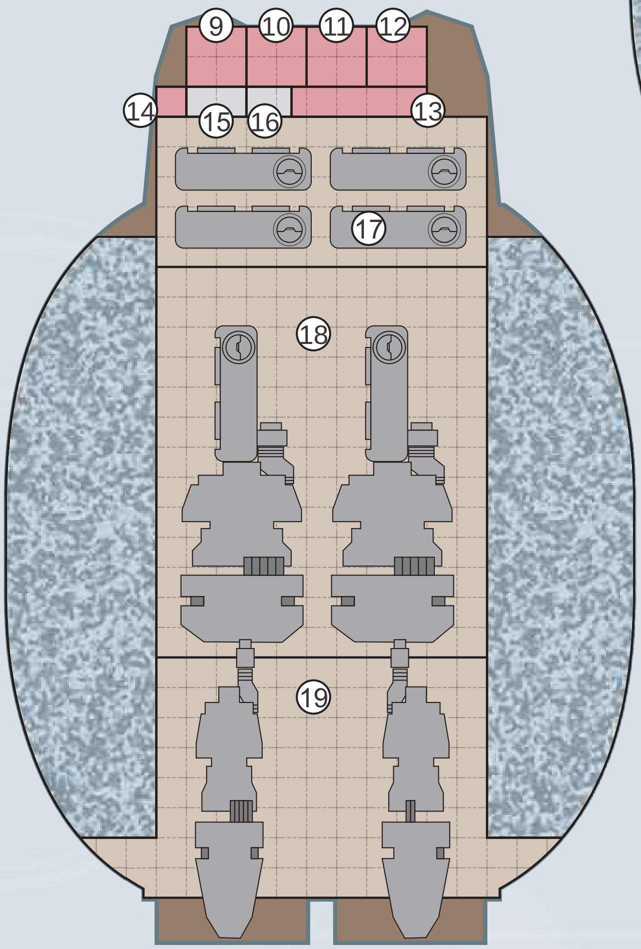


DECK 3

10. Sandcaster barrel storage
11. Medical bay
12. Repulsor
13. Nuclear damper
14. Armoury
15. Briefing room
16. Workshop
17. Power plant
18. Jump drive
19. Manoeuvre drive
20. Sensors
21. Bridge
22. Missile storage
23. Large missile bays
24. Common area
25. Staterooms

BATTLE RIDER

CLASS: HADRIAN

Named for famous pre-starflight emperors in ancient Vilani and Solomani history, the *Hadrian* battle rider is a stalwart example of its class: armed and armoured to the teeth and designed to emerge victorious over capital ships that are well above its tonnage. The *Hadrian* can be deployed by several classes of battle tender but are most often carried by the one million-ton *Warmonger*-class.

Once deployed, the *Hadrian* is designed to do battle while its tender refuels or seeks refuge among the fleet. If necessary, the battle rider can skim for fuel from gas giants and remain in the fight for extended periods of time.

TL15		Tons	Cost (MCr)
Hull	50,000 tons, Standard	—	2500
	Reinforced	—	1250
	Military	—	625
Armour	Bonded Superdense, Armour: 30	12,000	6000
	Radiation Shielding	—	1250
M-Drive	Thrust 6	3,000	6000
Power Plant	Fusion (TL15), Power 48,000	2,400	4800
Fuel Tanks	12 weeks of operation	720	—
Bridge	Holographic Controls	60	312.5
Computer	Core/80fib	—	142.5
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	18,000	7800
	Large Particle Beam Bays (Size Reduction x2) x2	800	150
	Medium Repulsor Bays x6	600	360
	Medium Missile Bays x50	5,000	1000
	Medium Railgun Bays x25	2.500	1250
	Triple Turrets (beam lasers) x100	100	250
	Triple Turrets (sandcasters) x100	100	175
	Point Defence Laser Batteries (Type III) x 9	180	180
Ammunition	Missile Storage (8,640 missiles)	720	—
	Sandcaster Canister Storage (4,500 canisters)	375	—
	Railgun Ammunition (200 shots)	400	—
Screens	Meson Screens x9	90	180
	Nuclear Dampers x9	90	90
Craft	Docking Spaces (40 tons) x6	264	66
	Pinnaces x6	—	58.08
Systems	Armoury	21	5.25
	Briefing Rooms x4	16	2
	Fuel Scoops	—	1
	Medical Bays x5	20	10
	Repair Drones	500	100
	Workshops x4	24	3.6

Crew

Captain, Pilots x3, Small Craft Pilots x6, Engineers x78, Maintenance x50, Medics x5, Gunners x280, Administrators x25, Officers x46, Sensops x9

Hull: 27,500

Running Costs

MAINTENANCE COST

MCr2.615702/month

PURCHASE COST

MCr31388.427

Power Requirements

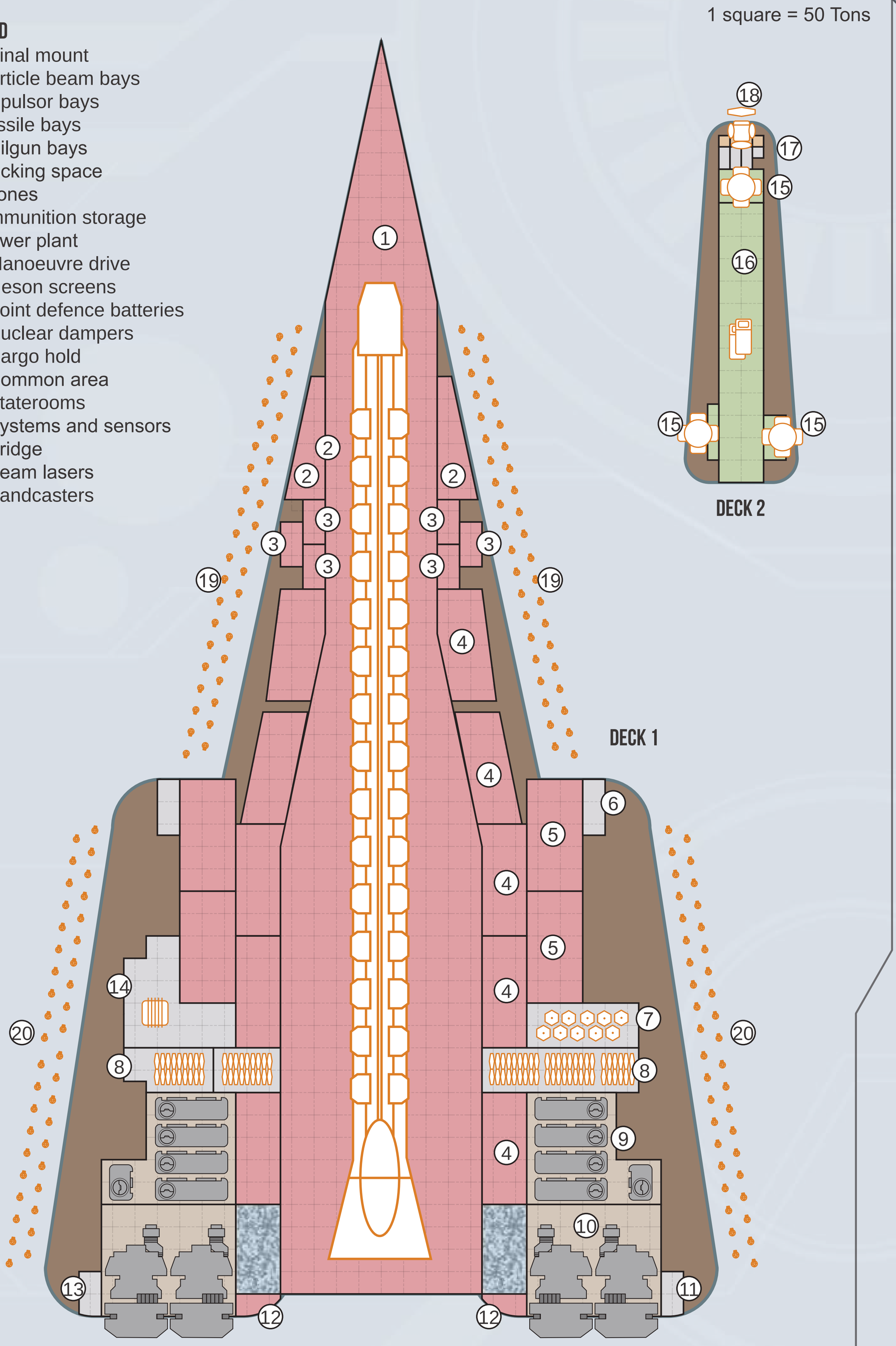
Basic Ship Systems	10,000
Manoeuvre Drive	30,000
Sensors	22
Weapons	6,305
Screens	450
Medical Bays	5

Staterooms	Standard x312	1,248	156
	High	6	0.8
Software	Advanced Fire Control/3	—	18
	Anti-Hijack/2	—	8
	Auto-Repair/2	—	10
	Battle Network/1	—	5
	Broad Spectrum EW	—	14
	Electronic Warfare/2	—	18
	Evade/2	—	2
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		314	31.4
Cargo		820	—
Total: MCr34876.03			

HADRIAN BATTLE RIDER

LEGEND

1. Spinal mount
2. Particle beam bays
3. Repulsor bays
4. Missile bays
5. Railgun bays
6. Docking space
7. Drones
8. Ammunition storage
9. Power plant
10. Manoeuvre drive
11. Meson screens
12. Point defence batteries
13. Nuclear dampers
14. Cargo hold
15. Common area
16. Staterooms
17. Systems and sensors
18. Bridge
19. Beam lasers
20. Sandcasters


1 square = 50 Tons
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FRONTIER CRUISER

CLASS: AZHANTI HIGH-LIGHTNING

The *Azhanti High Lightning* is an obsolete multi-purpose cruiser capable of a variety of different functions. Most notable is the ship's high jump (jump-5) capability, which gives it great reactive mobility. It is this quality that has kept the ship in service in spite of its inferior agility and weaponry.

Several examples of the ship have been transferred to the Scout Service and friendly client states. Much of the remaining examples of the class were refurbished to the below specifications and now serve as frontier cruisers on Imperial borders.

TL14		Tons	Cost (MCr)
Hull	60,000 tons, Standard	—	3000
	Reinforced	—	1500
Armour	Bonded Superdense, Armour: 9	4,320	2160
	Radiation Shielding	—	1500
M-Drive	Thrust 2	1,200	2400
J-Drive	Jump 5	7,505	11257.5
Power Plant	Fusion (TL12), Power 42,750	2,850	2850
Fuel Tanks	J-5, 8 weeks of operation	30,570	—
Bridge		60	300
Computer	Core/80	—	95
Sensors	Improved	3	4.3
	Distributed Arrays	6	8.6
Weapons	Particle Accelerator Spinal Mount (TL12)	6,300	2200
	Small Missile Bays x24	1,200	288
	Fusion Barbettes x30	150	120
	Triple Turrets (pulse lasers) x150	150	600
	Triple Turrets (sandcasters) x130	130	227.5
Ammunition	Missile Storage (2,880 missiles)	240	—
	Sandcaster Canister Storage (3,900 canisters)	195	—
Screens	Meson Screens x6	60	120
	Nuclear Dampers x5	50	50
Craft	Docking Spaces (40 tons) x5	220	55
	Pinnaces x5	—	48.4
	Docking Spaces (10 tons) x80	880	220
	Light Fighters x80	—	838.4
Systems	Armoury	33	8.25
	Briefing Rooms x7	28	3.5
	Fuel Processor (4,000 tons/day)	200	10
	Fuel Scoops	—	1
	Launch Tubes (10 tons) x2	200	100
	Medical Bays x7	28	14
	Recovery Decks (10 tons) x2	200	100
	Workshops x 4	24	3.6

Crew

Captain, Pilots x3, Small Craft Crew x85, Astrogator, Engineers x168, Maintenance x61, Medics x7, Gunners x377, Administrators x30, Officers x75, Sensops x12

Hull: 33,000

Running Costs

MAINTENANCE COST

MCr2.283079/month

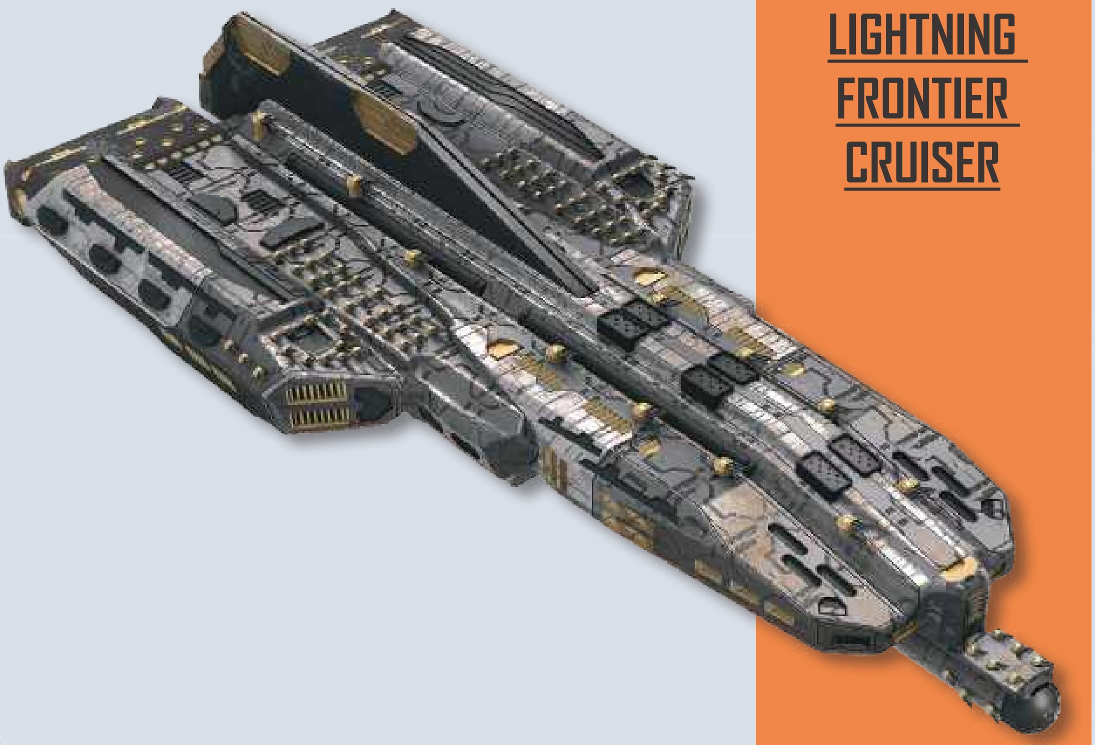
PURCHASE COST

MCr27396.945

Power Requirements

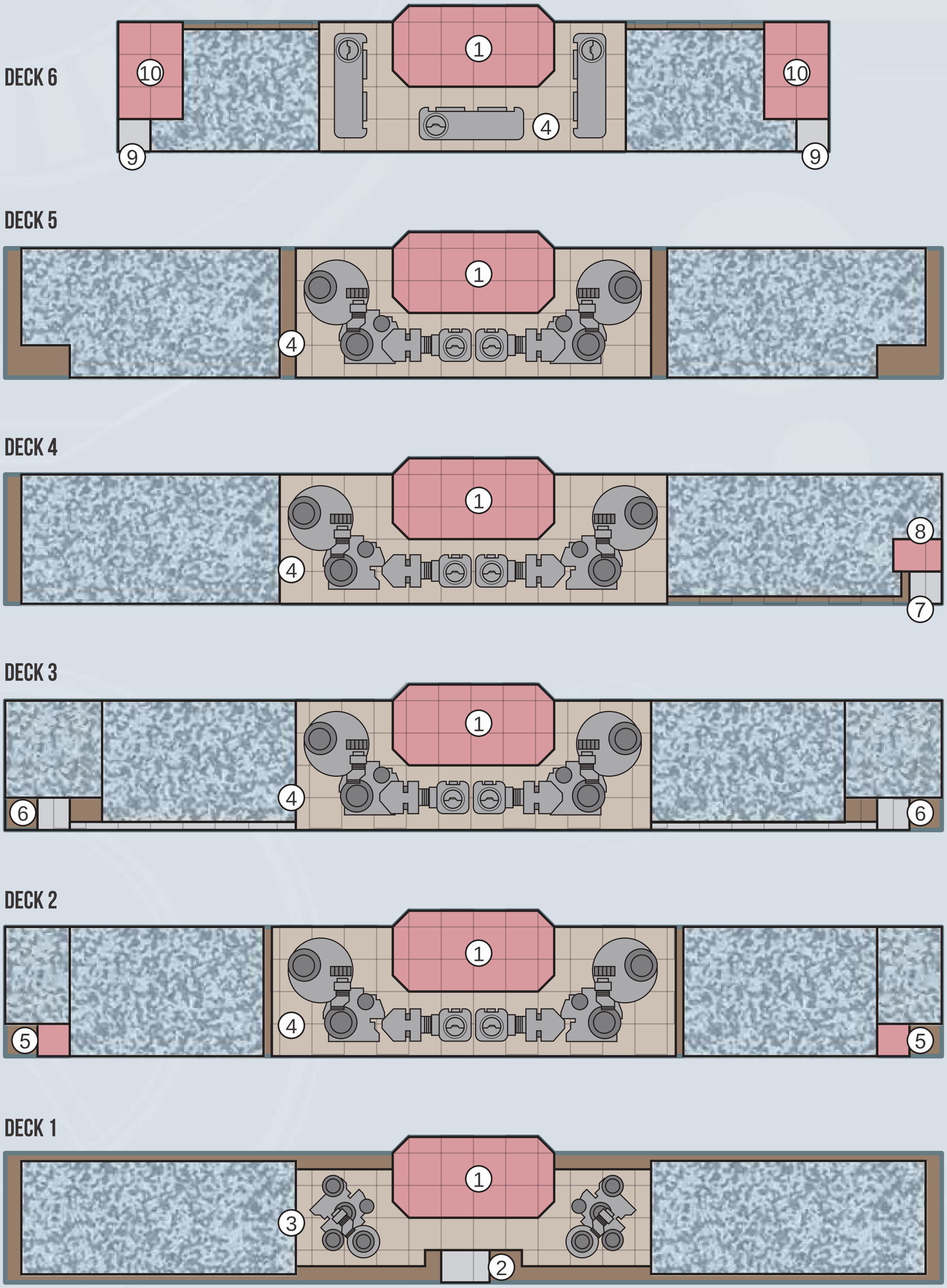
Basic Ship Systems	12,000
Manoeuvre Drive	12,000
Jump Drive	30,000
Sensors	12
Weapons	4,800
Screens	280
Fuel Processor	200
Launch Tubes	200
Medical Bays	7
Recovery Decks	200

Staterooms	Standard x500	2,000	250
	High	6	0.8
Software	Advanced Fire Control/1	—	12
	Anti-Hijack/3	—	10
	Broad Spectrum EW	—	14
	Electronic Warfare/2	—	18
	Evade/3	—	3
	Jump Control/5	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		502	50.2
Cargo		690	—
Total: MCr30441.05			



AZHANTI HIGH-LIGHTNING FRONTIER CRUISER

1 square = 50 Tons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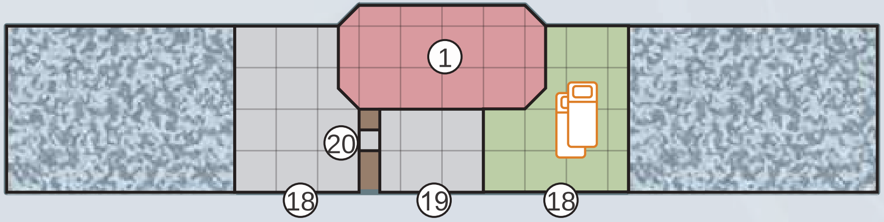
1 square = 50 Tons

LEGEND

1. Spinal mount
2. Screens
3. Manoeuvre drive
4. Jump drive
5. Pulse lasers
6. Nuclear dampers
7. Sandcaster canisters storage
8. Sandcasters
9. Missile storage
10. Missiles
11. Recovery deck
12. Cargo hold
13. Docking space
14. Fighters docking space
15. Launch tubes
16. Workshops
17. Fuel processor
18. Staterooms
19. Common area
20. Medbays

DECK 12



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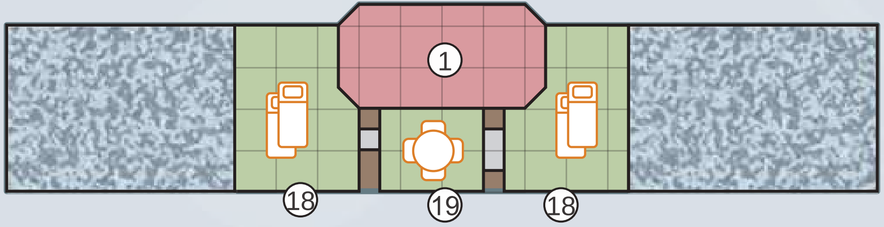

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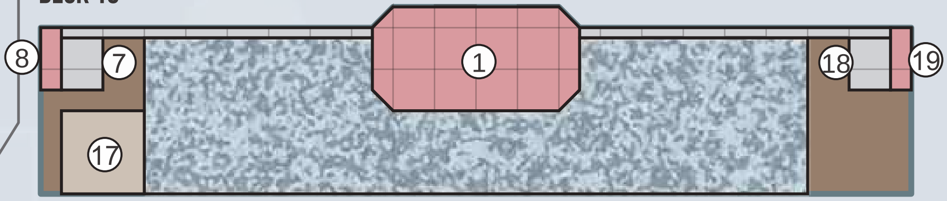

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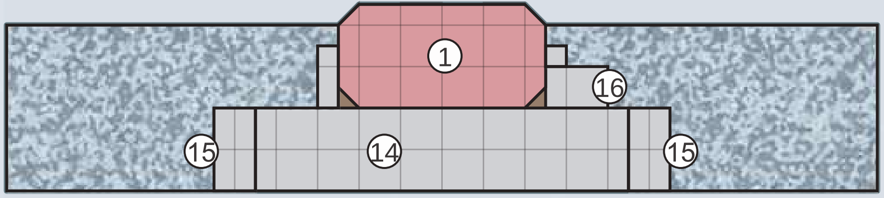

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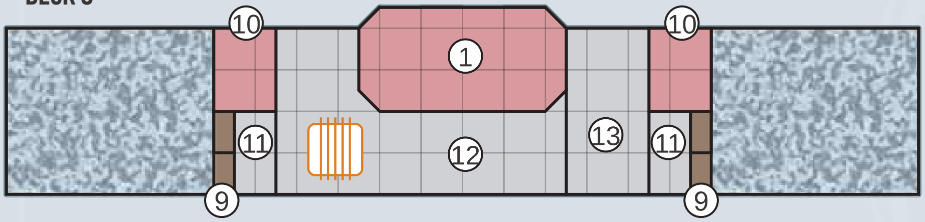
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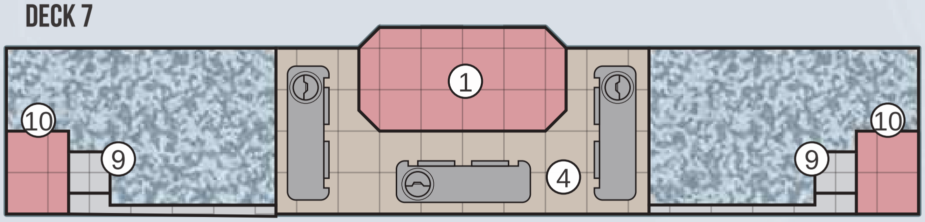

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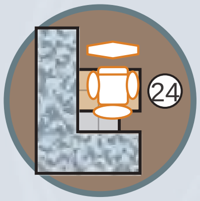
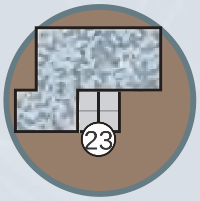




DECK 13

HEAVY CRUISER

CLASS: ATLANTIC

The *Atlantic* heavy cruiser is typical of the Imperial designs for such ships: a long flattened structure studded with weaponry, flaring aft for rudimentary control surfaces useful for fuel skimming. Well-armed and extremely well-armoured, it fulfils the basic design requirement of meeting the enemy and winning in battle.

The *Atlantic*, however, is fast approaching obsolescence and is not the equal of more modern vessels in the Imperium and neighbouring regions. The slight disadvantage of 5G acceleration is telling in otherwise equal engagements and make the class inferior enough to affect strategic judgements concerning its commitment.

An upgrade program to enhance the class was considered but decided against because of cost, although a number of enhanced prototypes have been reported.

This class of cruiser has lately proven popular with the Navy for independent missions, especially beyond the Imperial borders. Used alone, the ships are capable of a variety of diplomatic and scientific operations. Used in squadrons, they provide a useful show of force or reinforcement for friendly client-states.

Reportedly, some examples of the *Atlantic* have been fitted with black globe force field generators. This has not been confirmed.

TL14		Tons	Cost (MCr)
Hull	75,000 tons, Standard	—	3750
	Reinforced	—	1875
	Military	—	937.5
	Radiation Shielding	—	1875
Armour	Bonded Superdense, Armour: 25	15,000	7500
M-Drive	Thrust 5	3,750	7500
J-Drive	Jump 4 (Decreased Fuel)	7,505	12383.25
Power Plant	Fusion (TL12), Power 64,500	4,300	4300
Fuel Tanks	J-4, 8 weeks of operation	29,360	—
Bridge		60	375
Computer	Core/90	—	120
Sensors	Improved	3	4.3
	Distributed Arrays	6	8.6
	Enhanced Signal Processing	2	8
	Countermeasures Suite	2	4
Weapons	Meson Spinal Mount (TL14)	6375	2400
	Medium Particle Beam Bays x6	600	240
	Small Missile Bays x40	2,000	480
	Triple Turrets (sandcaster) x165	165	288.75
	Point Defence Laser Batteries (Type II) x4	80	40
Ammunition	Missile Storage (3,600 missiles)	300	—
	Sandcaster Canister Storage (4,920 canisters)	246	—
Screens	Meson Screens x6	60	120
Craft	Docking Space (50 tons)	55	13.75
	Modular Cutter	—	11.93
	Docking Space (40 tons)	44	11
	Pinnace	—	9.68
	Docking Space (30 tons)	33	8.25
	Ship's Boat	0	7.58
Systems	Armoury	29	7.25
	Briefing Rooms x3	12	1.5

Crew

Captain, Pilots x3, Small Craft Pilots x3, Astrogator, Engineers x222, Maintenance x75, Medics x6, Gunners x273, Administrators x38, Officers x64, Sensops x15

Hull: 41,250

Running Costs

MAINTENANCE COST

MCr3.361473/month

PURCHASE COST

MCr40337.676

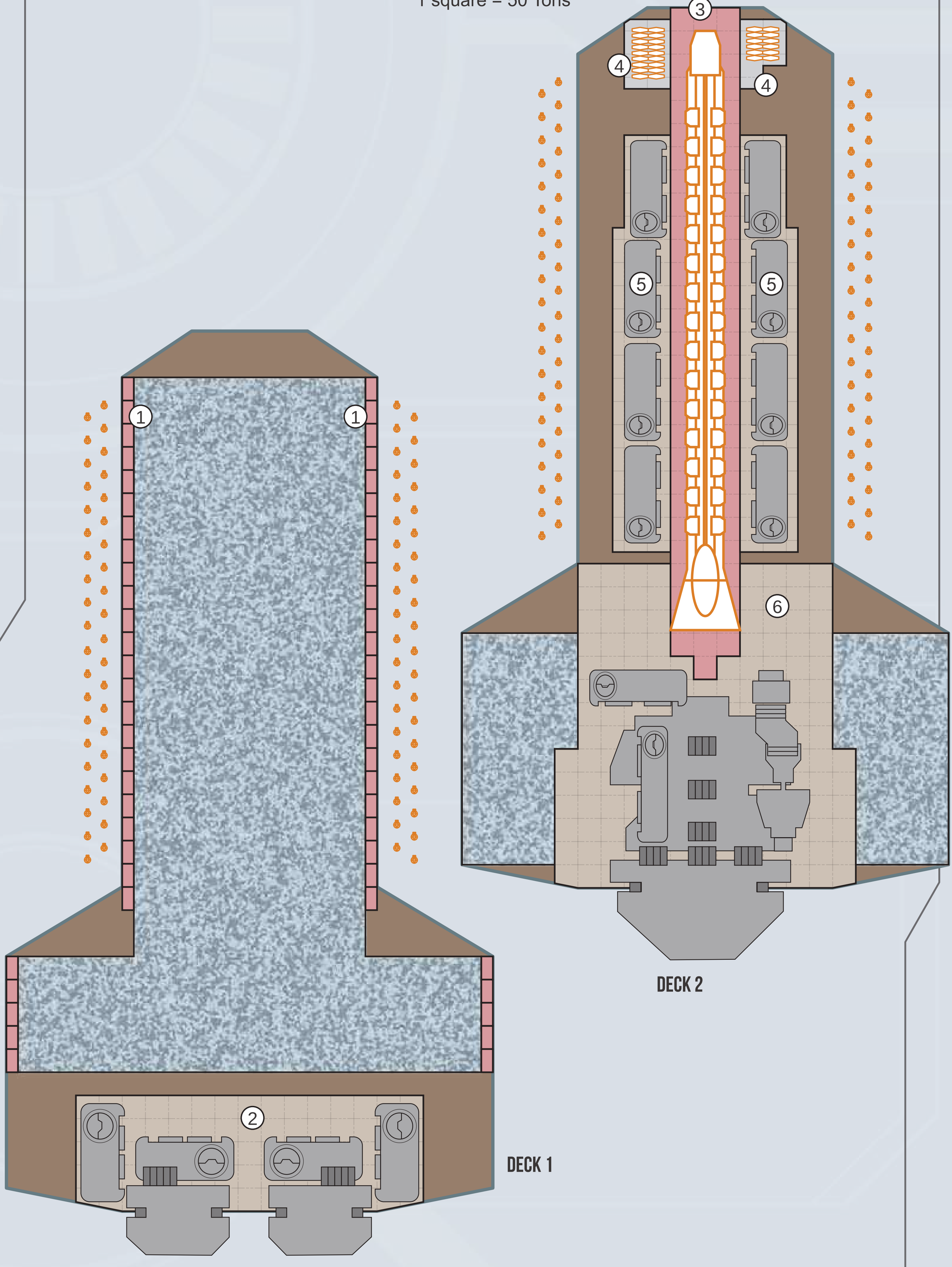
Power Requirements

Basic Ship Systems	15,000
Manoeuvre Drive	37,500
Jump Drive	30,000
Sensors	15
Weapons	1,745
Screens	180
Fuel Processor	500
Medical Bays	6

Systems	Fuel Processor (10,000 tons/day)	500	25
	Fuel Scoops	—	1
	Medical Bays x6	24	12
	Re-entry Capsules x700	350	14
	Repair Drones	750	150
	Workshops x3	18	2.7
Staterooms	Standard x441	1,764	220.5
	High	6	0.8
Software	Advanced Fire Control/2	—	15
	Anti-Hijack/3	—	10
	Auto-Repair/2	—	10
	Broad Spectrum EW	—	14
	Electronic Warfare/2	—	18
	Evade/2	—	2
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		443	44.3
Cargo		1,158	—
Total: MCr44819.64			

ATLANTIC HEAVY CRUISER

1 square = 50 Tons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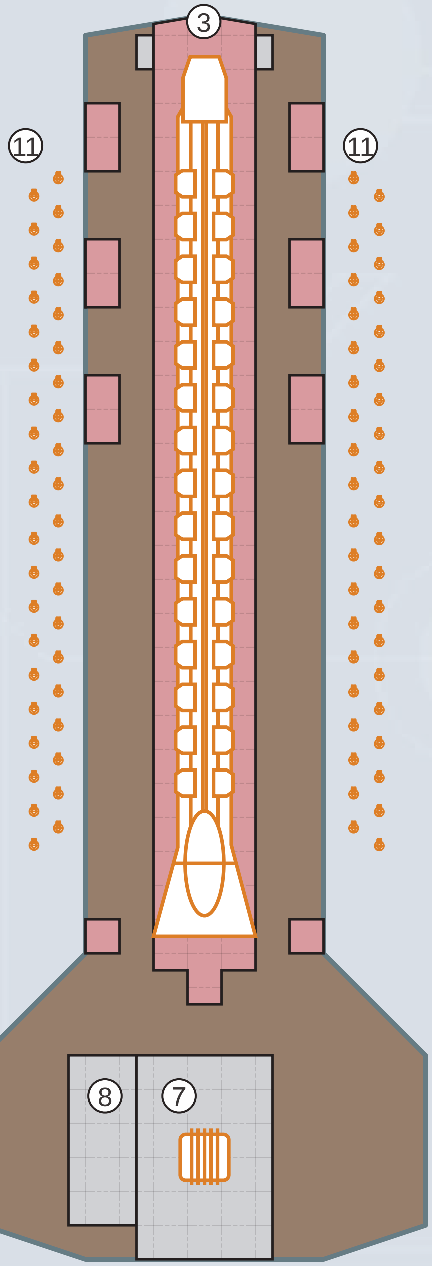
DECK 1

1 square = 50 Tons

LEGEND

1. Small missile bays
2. Manoeuvre drive
3. Spinal mount
4. Missile storage
5. Power plant
6. Jump drive
7. Cargo hold
8. Fuel processor
9. Re-entry capsules
10. Staterooms
11. Turrets
12. Drones
13. Docking spaces
14. Workshops and medbays
15. Common area
16. Brdige



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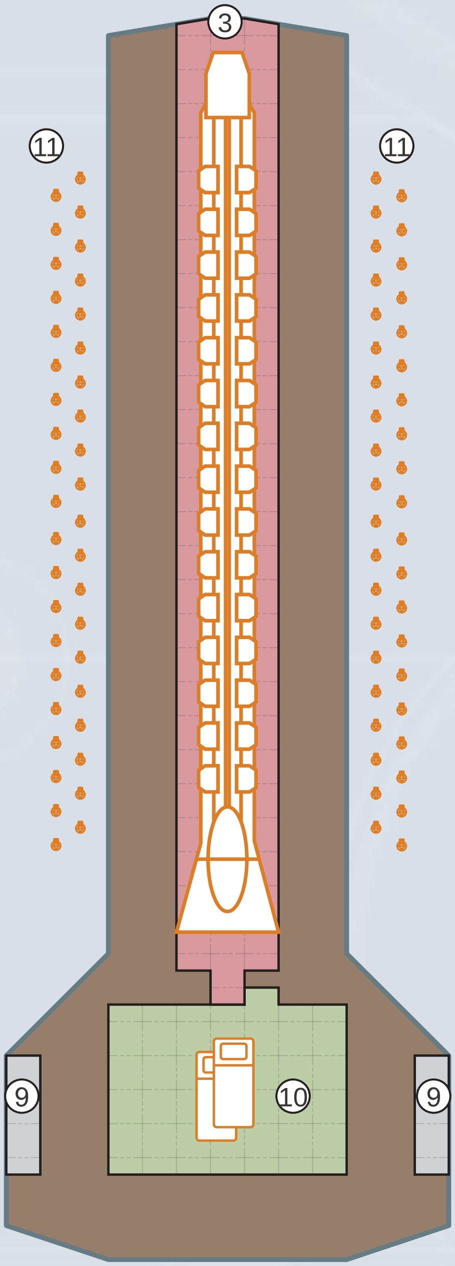

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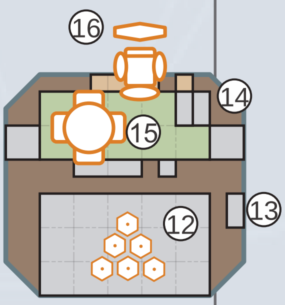


DECK 5

STRIKE CARRIER

CLASS: WIND

The *Wind* strike carrier is a particular artifact of the escalating tensions in the Spinward Marches. Designed and created for the transport of light fighters to the battle front, strike carriers are also well-armed, reasonably armoured and capable of standing in battle against most enemies.

The *Wind* is capable of entering enemy-held territory, either alone or with a small escort and overwhelming defences by weight of its fighter complement. As standard, its hangars carry 80 light fighters, although variants exist capable of launching heavy fighters or even troop transports. Where the threat level is deemed sufficiently low, a *Wind* strike carrier may jump into a system, launch fighters, then retreat to a gas giant to refuel while the smaller craft conduct patrols or limited attacks.

If cornered, the strike carrier is more than capable of defending itself against enemy vessels smaller than itself, even if the bulk of its fighters are engaged elsewhere. A powerful meson spinal mount gives it sufficient punch against capital ships, while batteries of missiles, beam lasers, particle beams and fusion guns provide more than enough firepower to destroy waves of smaller vessels.

TL15		Tons	Cost (MCr)
Hull	75,000 tons, Close Structure	—	3000
	Reinforced	—	1500
Armour	Bonded Superdense, Armour: 11	9,900	4950
	Radiation Shielding	—	1875
M-Drive	Thrust 6	4,500	9000
J-Drive	Jump 3	5,630	8445
Power Plant	Fusion (TL15), Power 78,000	3,900	7800
Fuel Tanks	J-3, 8 weeks of operation	23,280	—
Bridge	Holographic Controls	60	468.75
Computer	Core/70fib	—	120
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	18,000	7800
	Medium Repulsor Bays x9	900	540
	Small Missile Bays x32	1,600	384
	Triple Turrets (beam lasers) x200	200	500
	Triple Turrets (sandcasters) x100	100	175
	Double Turrets (fusion guns) x10	10	45
	Single Turrets (particle beams) x10	10	42
	Point Defence Laser Batteries (Type III) x8	160	160
Ammunition	Missile Storage (3,840 missiles)	320	—
	Sandcaster Canister Storage (3,000 canisters)	150	—
Screens	Meson Screens x9	90	180
	Nuclear Dampers x9	90	90
Craft	Docking Spaces (10 tons) x80	880	220
	Light Fighters x80	—	838.4
Systems	Armoury	40	10
	Briefing Rooms x12	48	6
	Fuel Processor (3,000 tons/day)	150	7.5

Crew

Captain, Pilots x3, Fighter Pilots x80, Astrogator, Engineers x202, Maintenance x75, Medics x8, Gunners x469, Administrators x37, Officers x89, Sensops x15

Hull: 41,250

Running Costs

MAINTENANCE COST

MCr3.655946/month

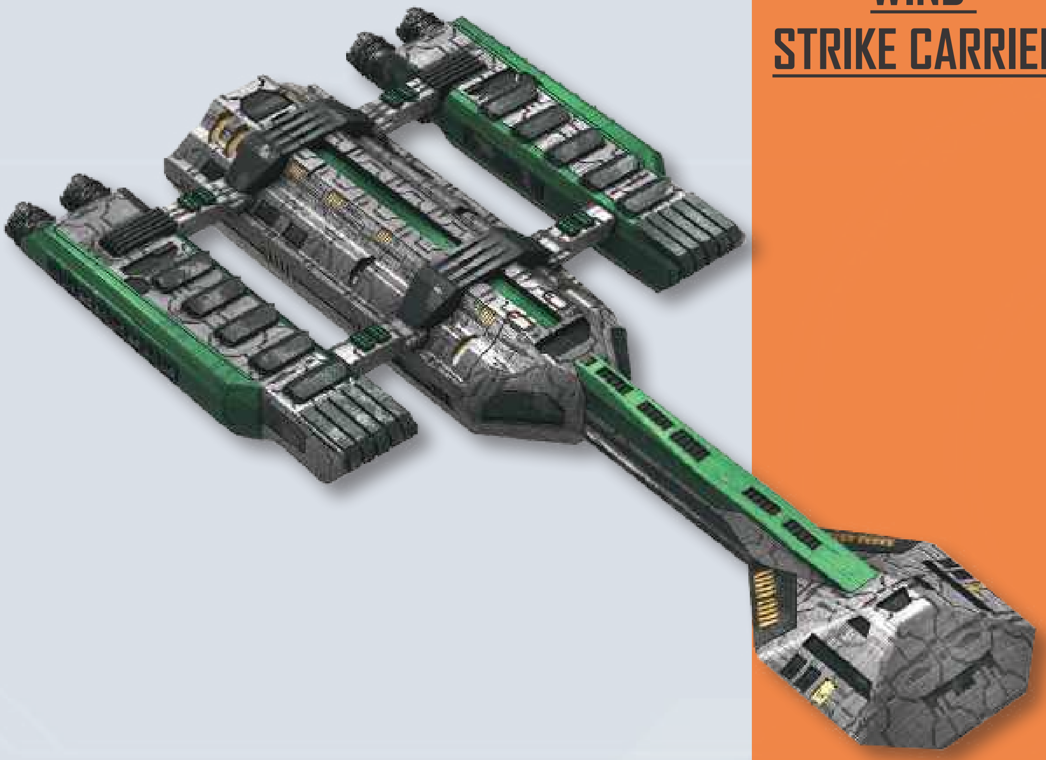
PURCHASE COST

MCr43871.355

Power Requirements

Basic Ship Systems	15,000
Manoeuvre Drive	45,000
Jump Drive	22,500
Weapons	7,340
Sensors	22
Screens	450
Fuel Processor	150
Launch Tube	100
Medical Bays	9
Recovery Deck	100

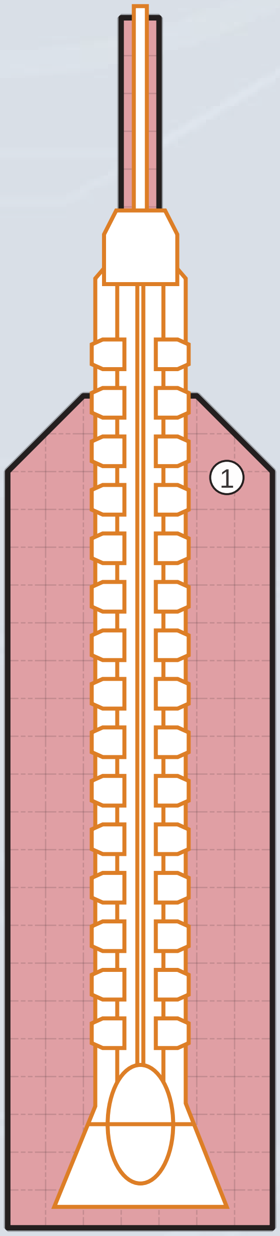
Systems	Fuel Scoops	—	1
	Launch Tube	100	50
	Medical Bays x9	36	18
	Recovery Deck	100	50
	Workshops x6	36	5.4
Staterooms	Standard x600	2,400	300
	High	6	0.8
Software	Advanced Fire Control/2	—	15
	Anti-Hijack/1	—	6
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Evade/2	—	2
	Jump Control/3	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		602	60.2
Cargo		1,670	—
Total: MCr48745.95			



WIND
STRIKE CARRIER

1 square = 50 Tons

LEGEND
1. Spinal mount
2. Bridge
3. Sensors
4. Briefing room
5. Armoury
6. Airlock
7. Small missile bay
8. Point defence battery
9. Missile storage
10. Sandcaster storage
11. Jump drive
12. Power plant
13. Manoeuvre drive
14. Staterooms
15. Launch tube
16. Docking space



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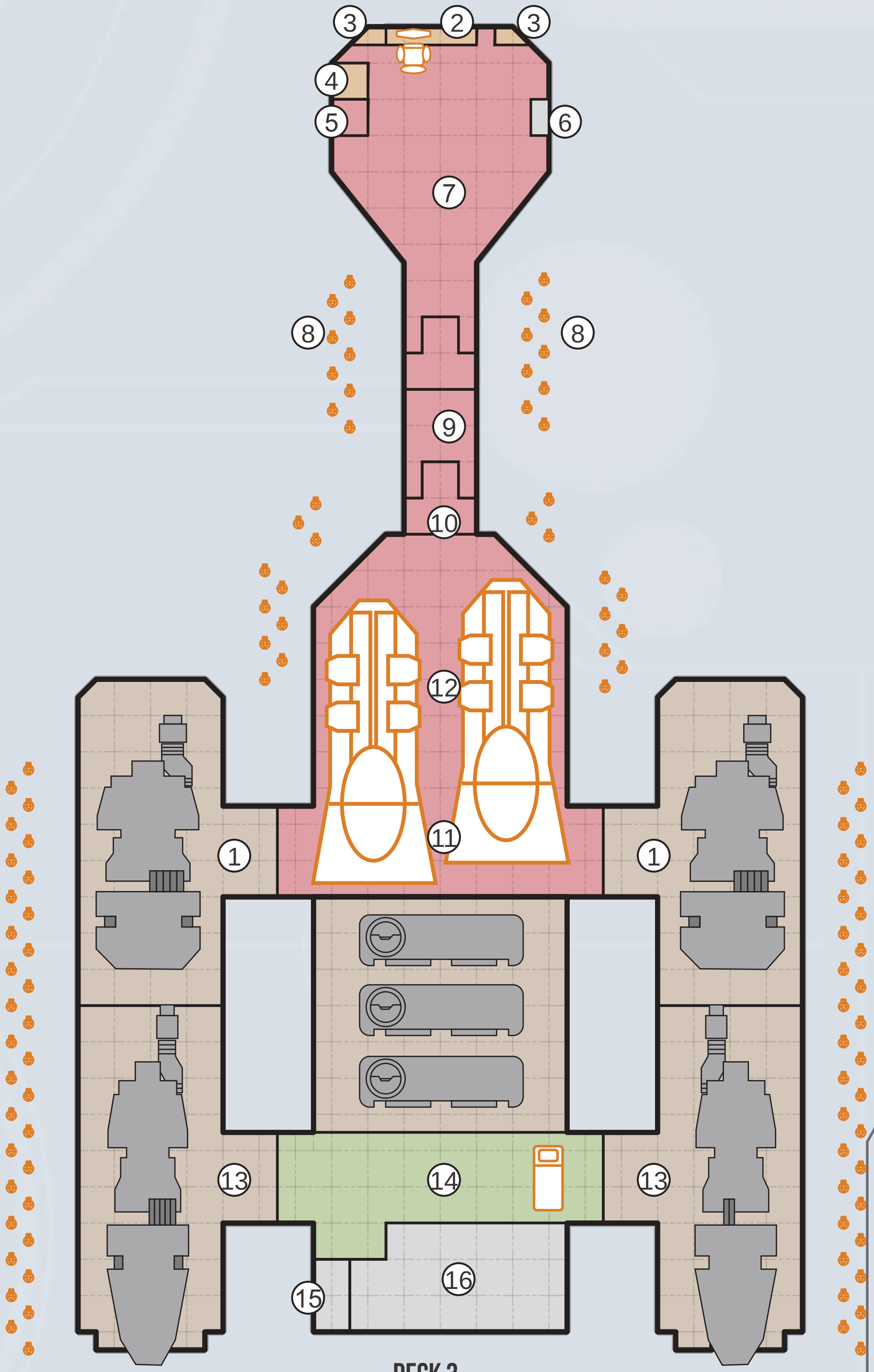
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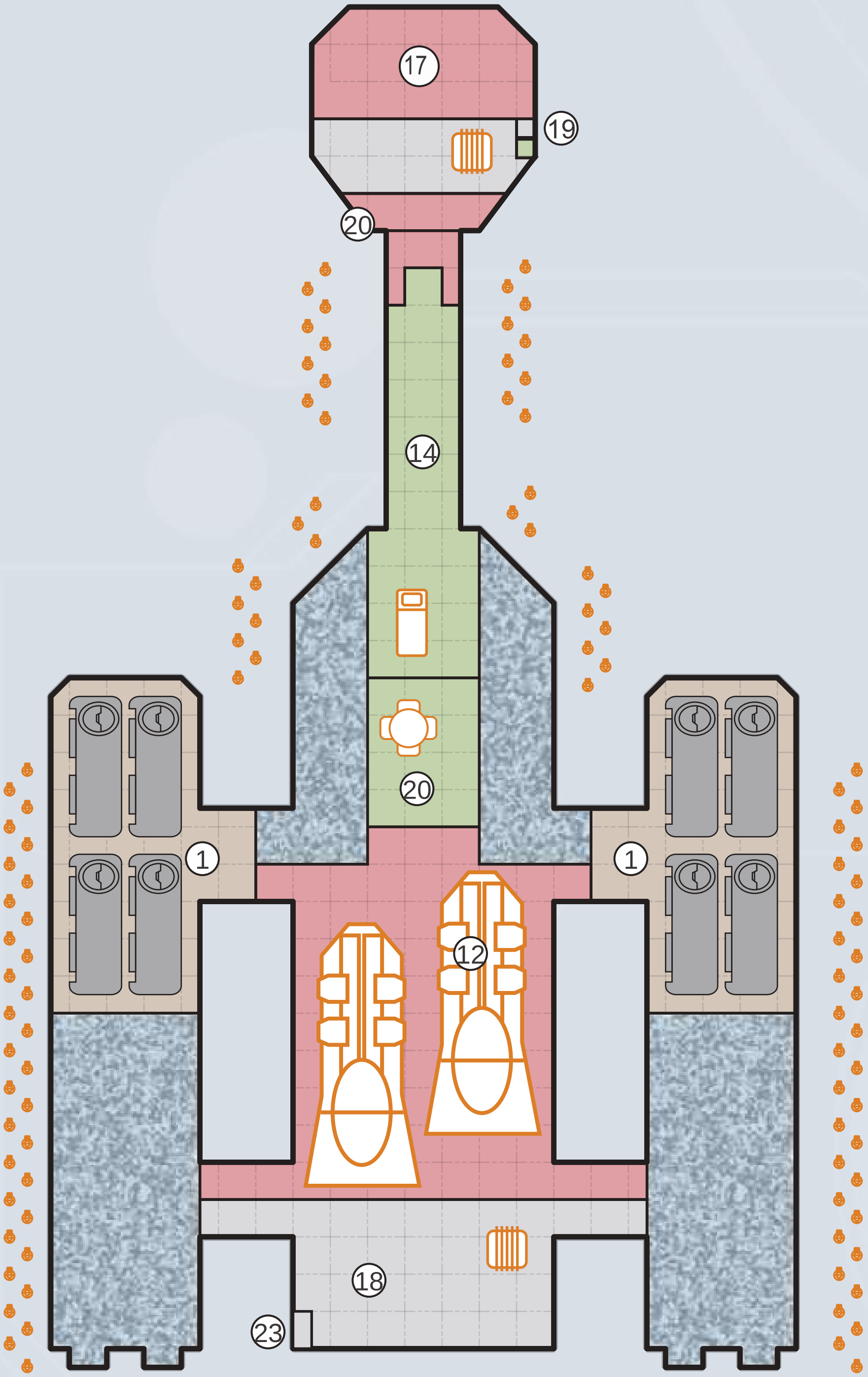
DECK 3

LEGEND

17. Repulsor bay
18. Cargo hold
19. Workshop
20. Nuclear damper
21. Meson screen
22. Common area
23. Airlock
24. Fuel processor

1 square = 50 Tons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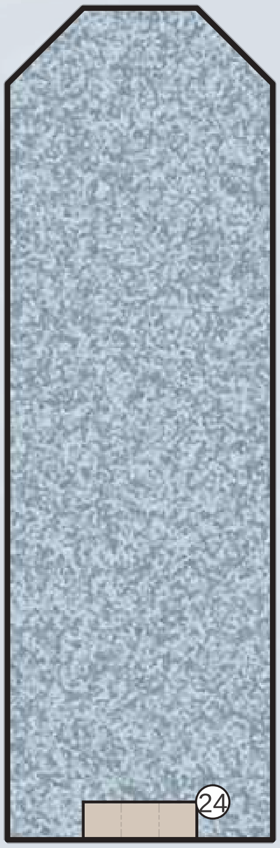


DECK 1

FLEET CARRIER

CLASS: ANTIAMA

Also known in naval circles as the mother ship, the fleet carrier is a transport and launch facility for heavy fighters. In peace, the fleet carrier is a mobile port and repair facility for its brood; in war, it is a formidable fleet element to be respected. The fleet carrier depends on its phalanx of 300 fighters for the majority of its protection. Typically, one-third of the fighter force is in flight at any one time. In addition, the ship can defend itself with its extensive armament – especially its missile salvos. In practice, the fleet carrier's low armour rating and agility make it vulnerable and clumsy in battle and it will join combat only to ensure recovery of its brood.

TL15		Tons	Cost (MCr)
Hull	100,000 tons, Standard	—	5000
	Reinforced	—	2500
Armour	Bonded Superdense, Armour: 10	8,000	4000
	Radiation Shielding	—	2500
M-Drive	Thrust 2	2,000	4000
J-Drive	Jump 4	10,005	15007.5
Power Plant	Fusion (TL15), Power 85,000	4,250	8500
Fuel Tanks	J-4, 8 weeks of operation	40,850	—
Bridge	Holographic Controls	60	625
Computer	Core/60	—	75
Sensors	Advanced	5	5.3
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Medium Meson Bay	100	60
	Medium Particle Beam Bay	100	40
	Medium Repulsor Bay	100	60
	Small Missile Bays x65	3,250	780
	Small Fusion Gun Bays x65	3,250	520
	Triple Turrets (beam lasers) x160	160	400
	Triple Turrets (sandcasters) x160	160	280
	Point Defence Laser Batteries (Type III) x10	200	200
Ammunition	Missile Storage (7,800 missiles)	650	—
	Sandcaster Canister Storage (4,800 canisters)	240	—
Screens	Meson Screens x9	90	180
	Nuclear Dampers x9	90	90
Craft	Docking Spaces (50 tons) x300	16,500	4125
	Heavy Fighters x300	—	22971
Systems	Armoury	56	14
	Briefing Rooms x34	136	17
	Fuel Processor (8,000 tons/day)	400	20
	Fuel Scoops	—	1
	Launch Tubes x3	1,500	750
	Medical Bays x12	48	24
	Recovery Decks x3	1500	750
	Workshops x8	48	7.2

Crew

Captain, Pilots x3, Fighter Crew x600, Astrogator, Engineers x198, Maintenance x75, Medics x11, Gunners x310, Administrators x33, Officers x124, Sensops x12

Hull: 73,333

Running Costs

MAINTENANCE COST

MCr5.55837/month

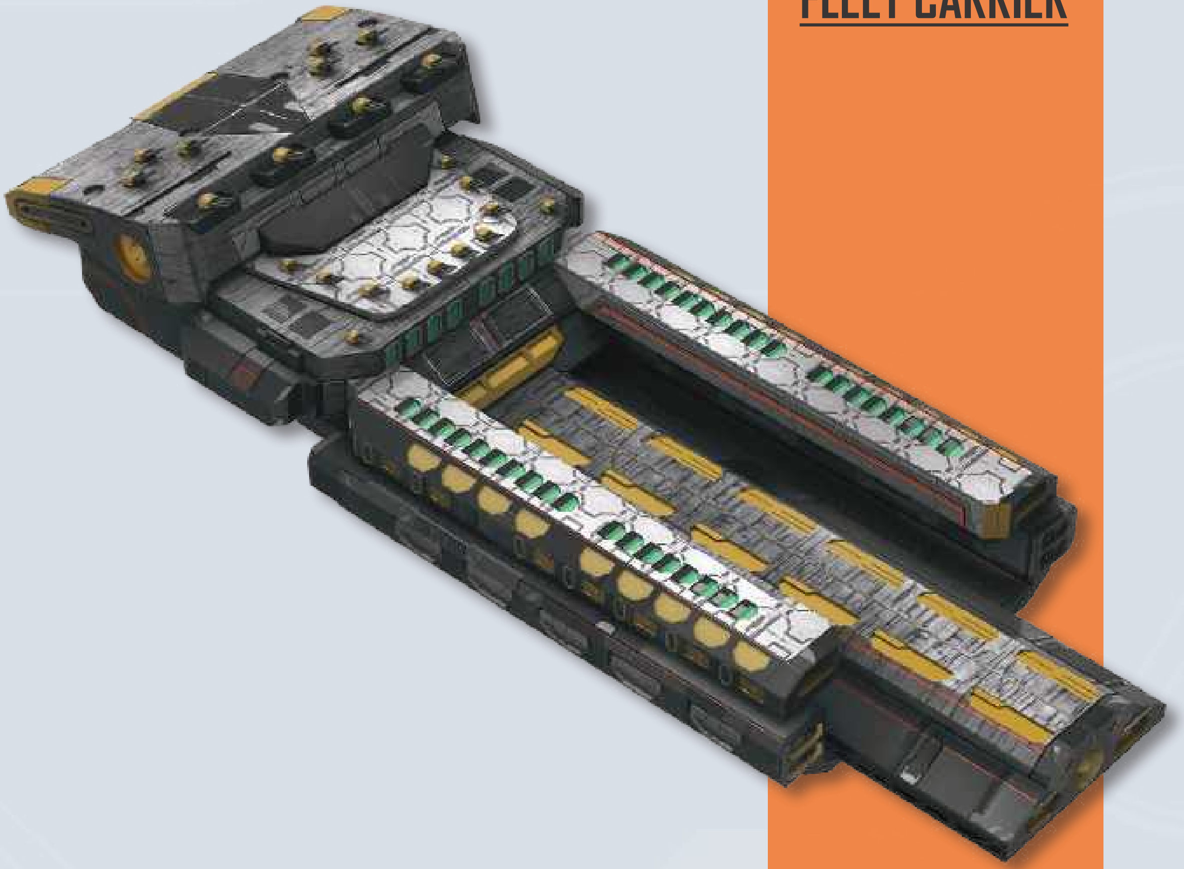
PURCHASE COST

MCr66700.44

Power Requirements

Basic Ship Systems	20,000
Manoeuvre Drive	20,000
Jump Drive	40,000
Sensors	22
Weapons	6,295
Screens	450
Fuel Processor	400
Launch Tubes	1,500
Medical Bays	12
Recovery Decks	1,500

Staterooms	Standard x850	3,400	425
	High	6	0.8
Software	Advanced Fire Control/1	—	12
	Anti-Hijack/1	—	8
	Broad Spectrum EW	—	14
	Electronic Warfare/2	—	18
	Evade/2	—	2
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		852	85.2
Cargo		1,967	—
Total: MCr74111.6			

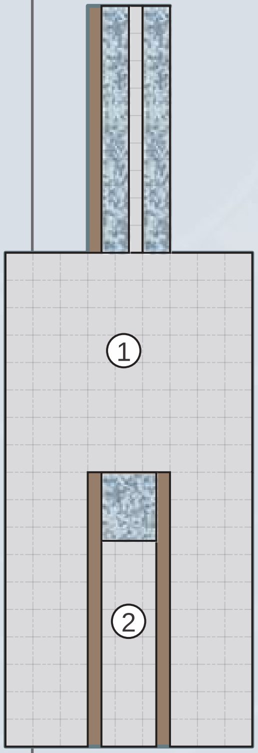


ANTIAMA FLEET CARRIER

LEGEND

1 square = 50 Tons

1. Docking space
2. Recovery deck
3. Launch tube
4. Cargo hold
5. Meson screens
6. Nuclear dampers
7. Meson bay
8. Particle beam bay
9. Repulsor bay



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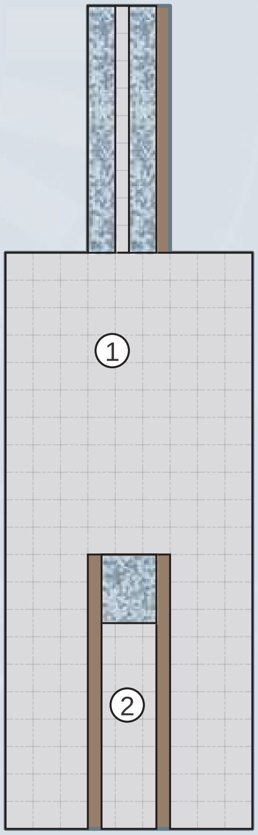

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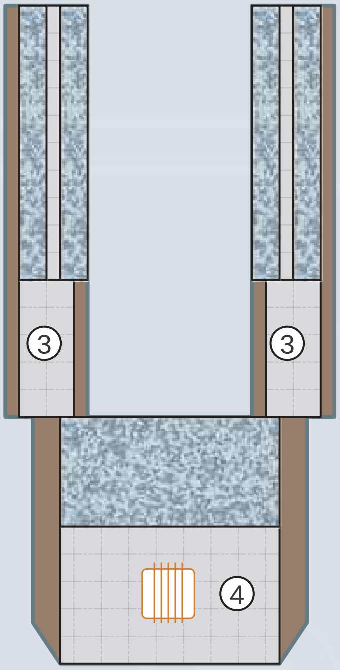

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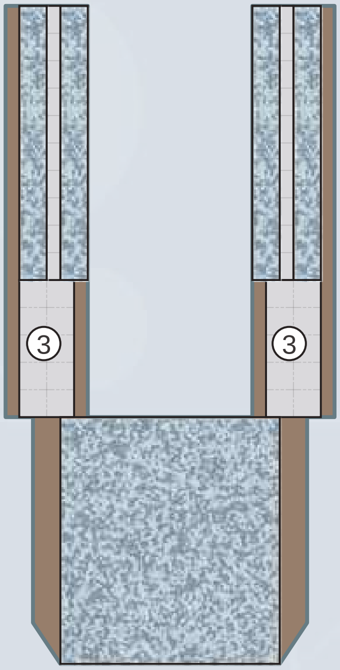

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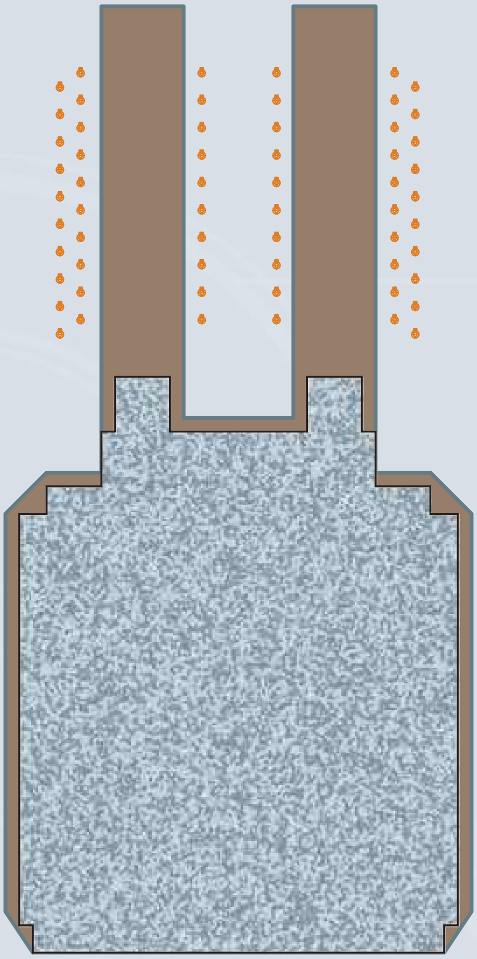
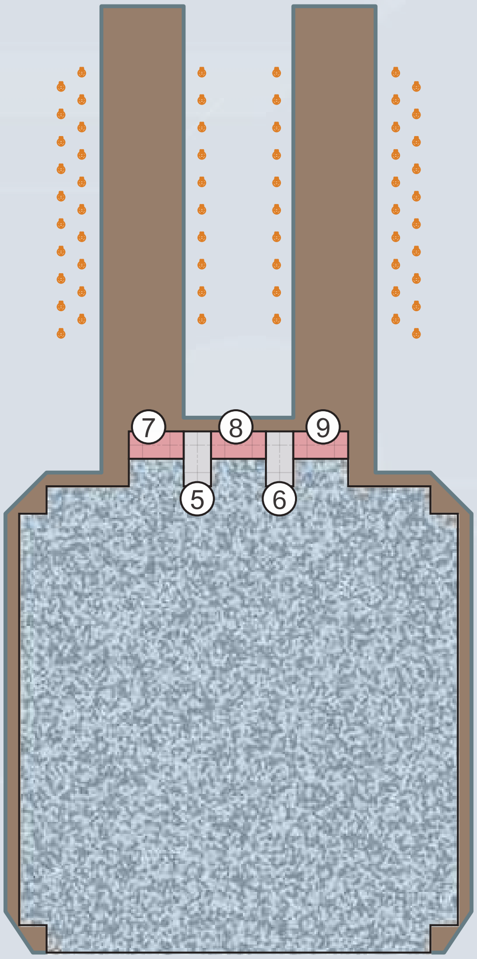
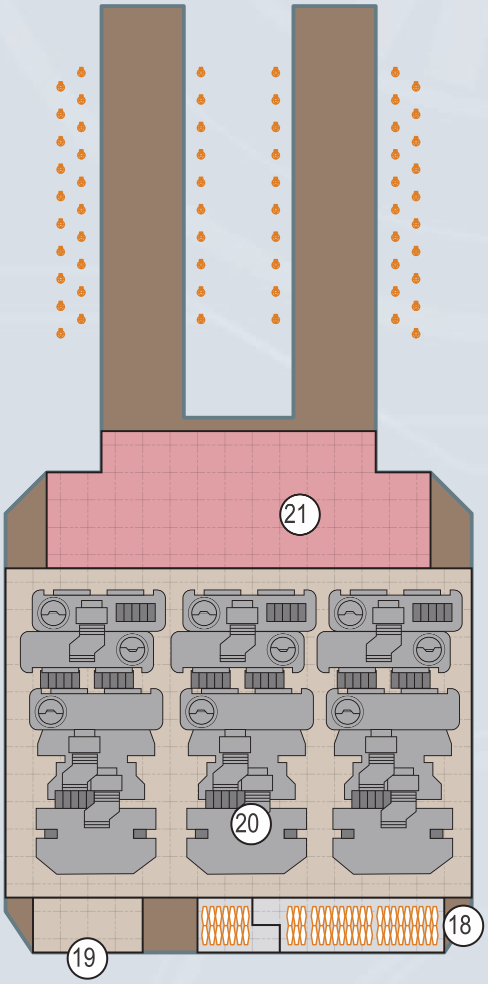


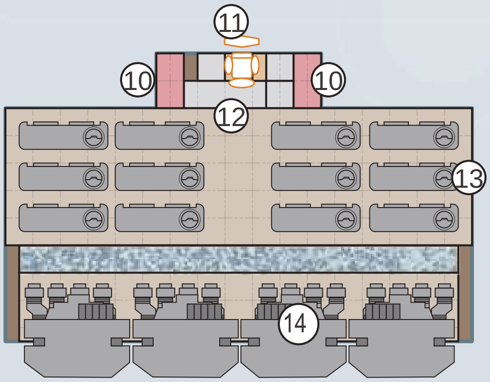
DECK 5

10. Point defence batteries
11. Bridge
12. Briefing room, armoury, medbay and workshop
13. Power plant
14. Manoeuvre drive
15. Missile bays
16. Staterooms
17. Common area
18. Ammunition storage
19. Fuel processor
20. Jump drive
21. Fusion gun bays

1 square = 50 Tons



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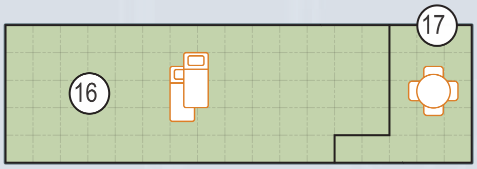

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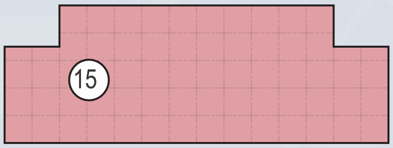


DECK 9

CLASS: GALIKA MEGULA

The *Galika Megula* dates back to the late First Imperium. Most examples in service really are that old, although many were mothballed for centuries at a time during the Long Night. Constructing one is a major affair involving multiple shipyards for over 10 years.

These freighters were originally designed to promote Vilani mercantile interests to 'barbarian' homeworlds that could sustain high volumes of trade but could not be trusted to maintain good starports, thus the ability to conduct wilderness refuelling if necessary, unusual among more modern freighters. At the time, jump-2 showcased the height of Vilani technological superiority. In modern times, these two elements see it conducting trade along the Imperial frontier, often the largest ship a world will ever see.

TL11		Tons	Cost (MCr)
Hull	200,000 tons, Sphere, Light Hull	—	5500
M-Drive	Thrust 2	4,000	8000
J-Drive	Jump 2	10,005	15007.5
Power Plant	Fusion (TL8, size reduction x 3), Power 81150	5,680.5	4260.375
Fuel Tanks	J-2, 4 weeks of operation	40569	—
Bridge		60	1000
Computer	Computer/10	—	0.16
Sensors	Basic, Distributed Arrays	—	—
Systems	Fuel Processor (20,000 tons/day)	1,000	50
	Fuel Scoops	—	1
	Cargo Crane	458	458
	Medical Bay x2	8	4
	Workshop	198	22.7
	Biospheres	155	31
Staterooms	Standard x1580	632	79
	High x4	24	3.2
Software	Manoeuvre	—	—
	Jump Control/2	—	0.2
	Library	—	—
	Intellect	—	—
Common Areas		328	32.8
Cargo		136,882.5	—
Total: MCr36286.56			

Crew

Pilot, Astrogator, Engineers x185, Mechanics x66, Medics x2, Administrators x33, Sensor Operators x8, Officers x14

Hull: 72,000

Running Costs

MAINTENANCE COST

MCr2.72/month

PURCHASE COST

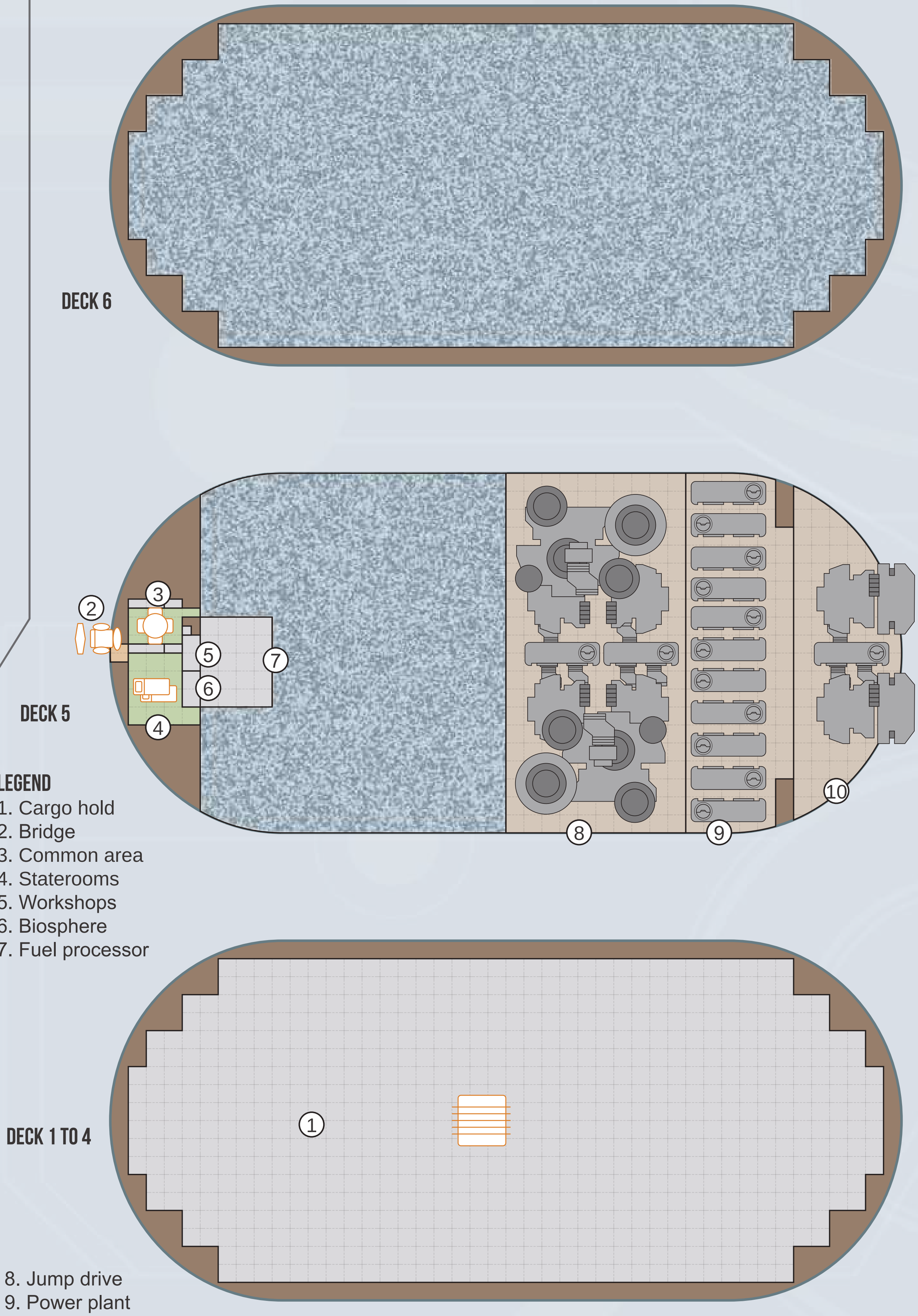
MCr32657.904

Power Requirements

Basic Ship Systems	40,000
Manoeuvre Drive	40,000
Jump Drive	40,000
Medical Bay	2
Biospheres	155
Fuel Processor	1,000

GALIKA MEGULA FREIGHTER

1 square = 50 Tons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DECK 5
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LEGEND

1. Cargo hold
2. Bridge
3. Common area
4. Staterooms
5. Workshops
6. Biosphere
7. Fuel processor
8. Jump drive
9. Power plant
10. Manoeuvre drive

DREADNOUGHT

CLASS: KOKIRRAK

The *Kokirrak* dreadnought is one of the more common classes of capital ships in service in the Spinward Marches; a total of four BatRons of this type serve on permanent station, with harbour assignments at Rhylanor, Regina, Jewell and Mora. Generally, one squadron of *Kokirraks* is dispersed into independent ships with ancillary escorts. On patrol, the ships combine training operations with routine patrols and reaction operations.

The *Kokirrak* is a preferred ship for flagship operations due to its extensive admiral's quarters, which include command and communications equipment, as well as entertainment chambers. The ship is capable of controlling a large fleet engagement within a system, as well as holding its own in battle; the combination of fleet controller and line-of-battle ship makes it an asset in nearly any space combat situation.

The *Kokirrak*s are one of the older classes of dreadnoughts in Imperial service and are now being phased out of service. Within the last decade, several ships have been disposed of to other services, such as the scouts, and to other governments, including sector navies and client-states in the Spinward border regions of the Imperium.

TL15		Tons	Cost (MCr)
Hull	200,000 tons, Standard	—	10000
	Reinforced	—	5000
	Modular Hull (5,800 tons)	—	290
Armour	Bonded Superdense, Armour: 15	24,000	12000
	Radiation Shielding	—	5000
M-Drive	Thrust 6	12,000	24000
J-Drive	Jump 4 (size reduction x2)	16,004	37509.375
Power Plant	Fusion (TL15), Power 180,000	9,000	18000
Fuel Tanks	J-4, 16 weeks of operation	83,600	—
Bridge	Holographic Controls	80	1250
	Command Bridge	40	30
Computer	Core/90	—	120
Backup	Core/80	—	95
Sensors	Advanced x 2	10	10.6
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	30,000	13000
	Small Missile Bays x50	2,500	600
	Small Fusion Gun Bays x50	2,500	400
	Triple Turrets (long range beam lasers) x300	300	862.5
	Triple Turrets (sandcasters) x200	200	350
	Single Turrets (intense focus particle beam) x330	330	1716
	Point Defence Laser Batteries (Type III) x20	400	400
Ammunition	Missile Storage (12,000 missiles)	1,000	—
	Sandcaster Canister Storage (6,000 canisters)	300	—
Screens	Black Globe Generator	50	100
	Meson Screens x8	80	160
	Nuclear Dampers x9	90	90

Crew

Captain, Pilots x3, Small Craft Crew x10, Astrogator, Engineers x349, Maintenance x142, Medics x12, Gunners x724, Administrators x66, Officers x132, Sensops x25

Hull: 146,666

Running Costs

MAINTENANCE COST

MCr9.928854/month

PURCHASE COST

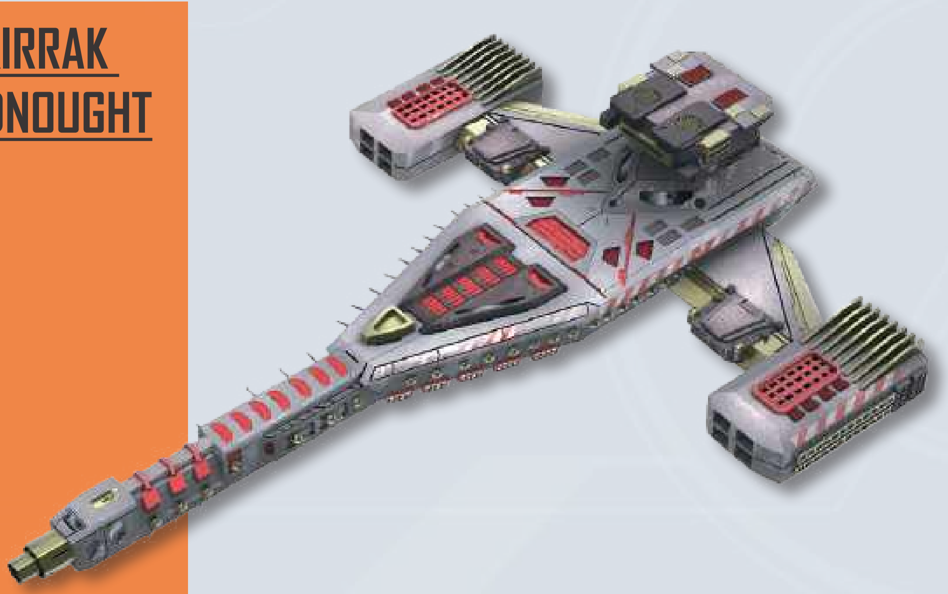
MCr119146.2525

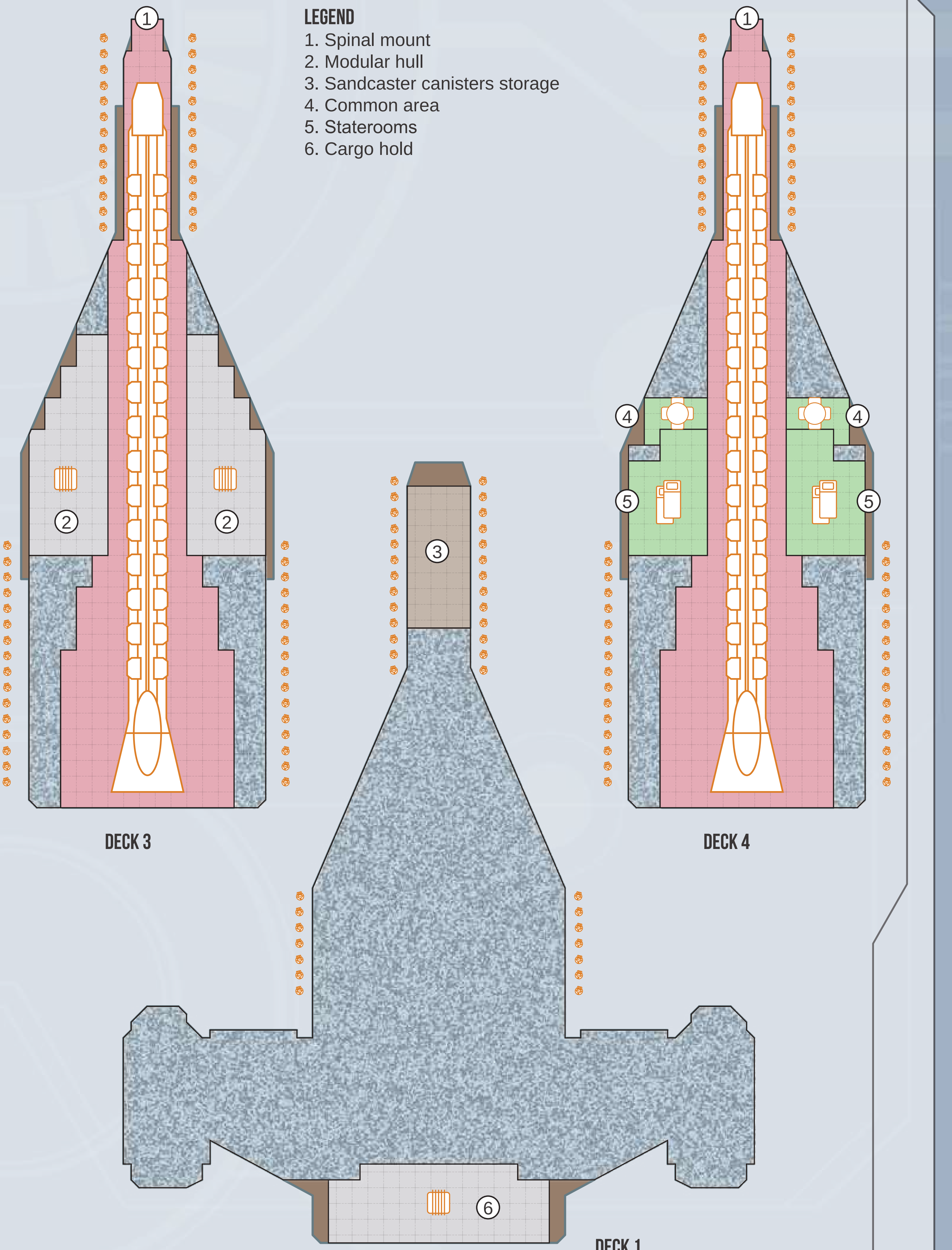
Power Requirements

Basic Ship Systems	40,000
Manoeuvre Drive	120,000
Jump Drive	80,000
Sensors	28
Weapons	15,450
Screens	450
Fuel Processor	1,250
Medical Bays	13

Craft	Docking Spaces (50 tons) x4	220	55
	Modular Cutters x4	—	47.72
Craft	Docking Spaces (40 tons) x4	176	44
	Pinnaces x4	—	38.72
	Docking Spaces (30 tons) x2	66	16.5
	Ship's Boats x2	—	15.16
Systems	Armoury	59	14.75
	Briefing Rooms x10	40	5
	Fuel Processor (25,000 tons/day)	1,250	62.5
	Medical Bays x13	52	26
	Repair Drones	2,000	400
	Workshops x6	36	5.4
Staterooms	Standard x900	3,600	450
	High x3	18	2.4
Software	Advanced Fire Control/2	—	12
	Anti-Hijack/2	—	8
	Auto-Repair/2	—	10
	Battle System/1	—	18
	Broad Spectrum EW	—	14
	Electronic Warfare/1	—	15
	Evade/1	—	1
	Jump Control/4	—	—
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
Common Areas		905	90.5
Cargo		3,267	—
	Module Storage	5,800	—
Total: MCr132384.725			

KOKIRRAK DREADNOUGHT

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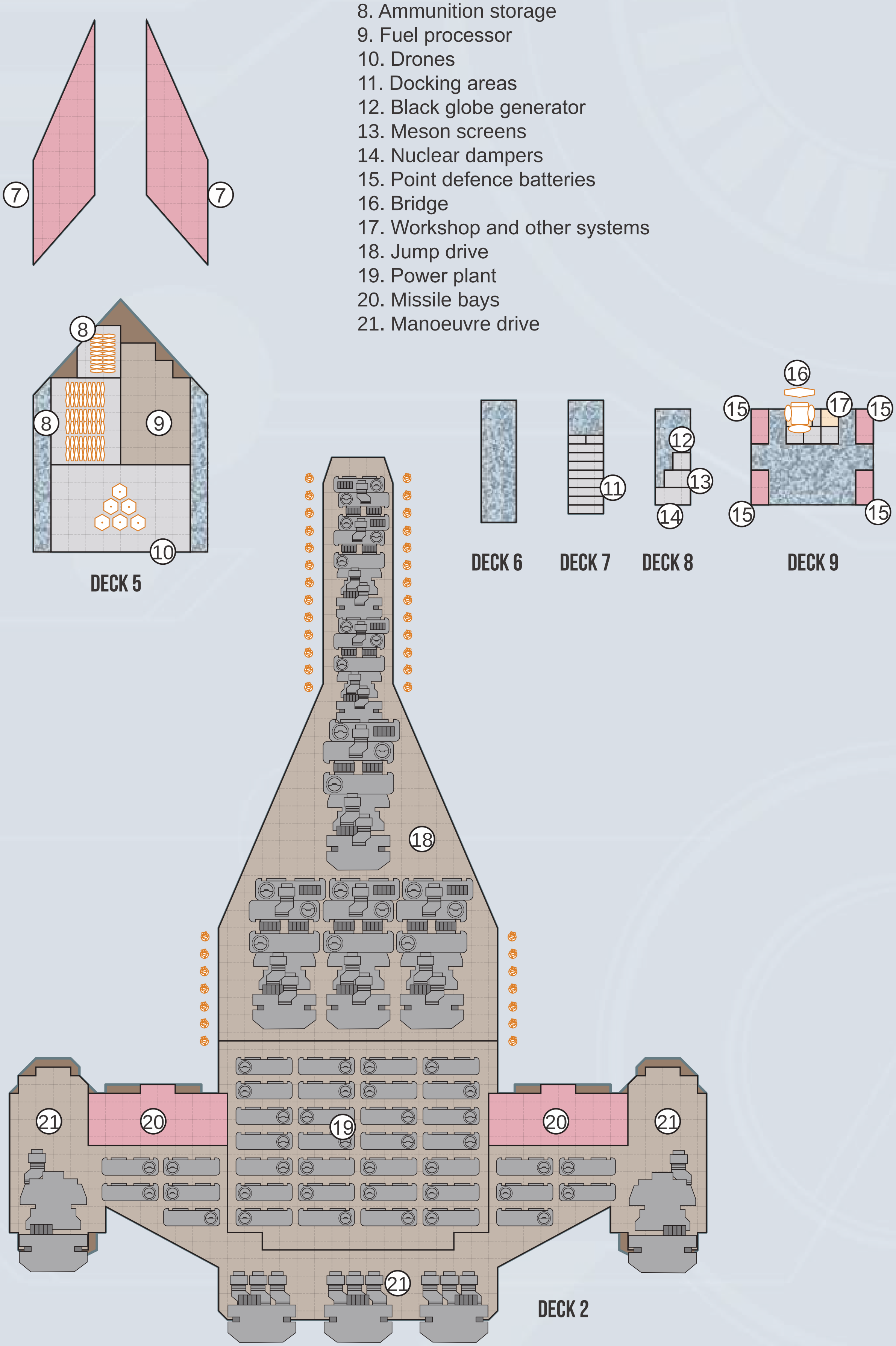
DECK 3
DECK 4
DECK 1

LEGEND

1. Spinal mount
2. Modular hull
3. Sandcaster canisters storage
4. Common area
5. Staterooms
6. Cargo hold

1 square = 50 Tons

LEGEND
7. Fusion gun bays
8. Ammunition storage
9. Fuel processor
10. Drones
11. Docking areas
12. Black globe generator
13. Meson screens
14. Nuclear dampers
15. Point defence batteries
16. Bridge
17. Workshop and other systems
18. Jump drive
19. Power plant
20. Missile bays
21. Manoeuvre drive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DECK 8
DECK 9
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DECK 2

The *Plankwell* dreadnought is a more specialised ship than the multi-task oriented *Tigress*-class. Lacking the large fighter screen, the *Plankwell* fulfils a more traditional battleship role, as the centre of a fleet of supporting ships.

For decades, the Imperial Fleet in the Spinward Marches has included at least one BatRon of *Plankwell* ships but recently (1102), the last such squadron was rotated to the strategic reserve in Corridor Sector. Sentiment in Naval and Sector circles runs high in favour of the return of at least one BatRon to the Marches.

Plankwell dreadnoughts are named for notable admirals in the Imperial Navy. The class name is taken from Grand Admiral Olav hault-Plankwell, a sector admiral in the Spinward Marches who rose to Grand Admiral of the Marches and lead the defeat of the Outworld Coalition during the First Frontier War (589 to 604). Following his victory in 604, he led the fleet to the Core, personally dispatched the Empress Jaqueline I, and took over the government.

TL15		Tons	Cost (MCr)
Hull	200,000 tons, Standard	—	10000
	Reinforced	—	5000
	Military	—	2500
Armour	Bonded Superdense, Armour: 21	33,600	16800
	Radiation Shielding	—	5000
M-Drive	Thrust 5	10,000	20000
J-Drive	Jump 4	20,005	30007.5
Power Plant	Fusion (TL15), Power 165,000	8,250	16500
Fuel Tanks	J-4, 16 weeks of operation	83,300	—
Bridge	Holographic Controls	80	1250
	Command Bridge	40	30
Computer	Core/90	—	120
Backup	Core/80	—	95
Sensors	Advanced x 2	10	10.6
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	24,000	10400
	Small Missile Bays x50	2,500	600
	Medium Repulsor Bays x50	5,000	3000
	Triple Turrets (long range beam lasers) x100	100	287.5
	Triple Turrets (sandcasters) x100	100	175
	Double Turrets (high yield fusion guns) x30	30	147
	Single Turrets (intense focus particle beam) x400	400	2080
	Point Defence Laser Batteries (Type III) x20	400	400
Ammunition	Missile Storage (12,000 missiles)	1,000	—
	Sandcaster Canister Storage (6,000 Canisters)	300	—
Screens	Meson Screens x3	30	60
	Nuclear Dampers x9	90	90

Crew

Captain, Pilots x3, Small Craft Crew x600, Astrogator, Engineers x360, Maintenance x132, Medics x11, Gunners x568, Administrators x66, Officers x117, Sensops x25

Hull: 146,666

Running Costs

MAINTENANCE COST

MCr9.440599/month

PURCHASE COST

MCr113287.185

Power Requirements

Basic Ship Systems	40,000
Manoeuvre Drive	100,000
Jump Drive	80,000
Sensors	28
Weapons	15,600
Screens	270
Fuel Processor	1,250
Medical Bays	11

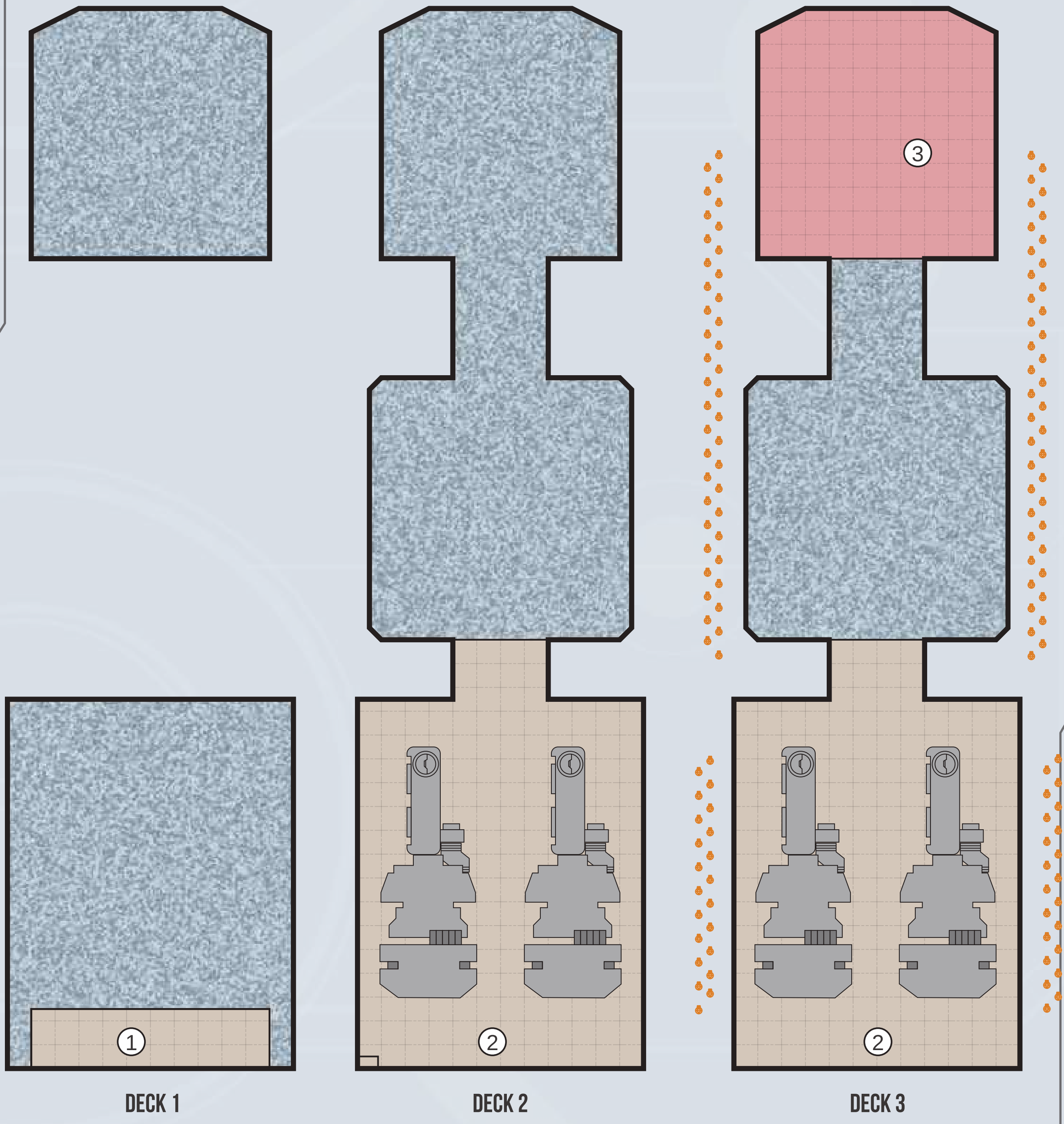
Craft	Docking Spaces (50 tons) x5	275	68.75
	Modular Cutters x5	—	59.65
Systems	Armoury	53	13.25
	Briefing Rooms x8	32	4
	Fuel Processor (25,000 tons/day)	1,250	62.5
	Fuel Scoops	—	1
	Medical Bay x 11	44	22
	Repair Drones	2,000	400
	Workshops x6	36	5.4
Staterooms	Standard x800	3,200	400
	High x3	18	2.4
Software	Advanced Fire Control/3	—	18
	Anti-Hijack/3	—	10
	Auto-Repair/2	—	10
	Battle System/3	—	36
	Broad Spectrum EW	—	14
	Electronic Warfare/3	—	24
	Evade/3	—	3
	Jump Control/4	—	—
	Launch Solution/3	—	16
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
	Screen Optimiser	—	5
	Virtual Crew/2	—	10
	Virtual Gunner/2	—	10
Common Areas		805	80.5
Cargo		3,025	—
Total: MCr125874.65			

KOKIRRAK DREADNOUGHT

LEGEND

1. Fuel processor
2. Jump drive
3. Repulsor bays
4. Power plant
5. Point defence batteries
6. Docking space
7. Airlock
8. Cargo hold
9. Repair drones

1 square = 50 Tons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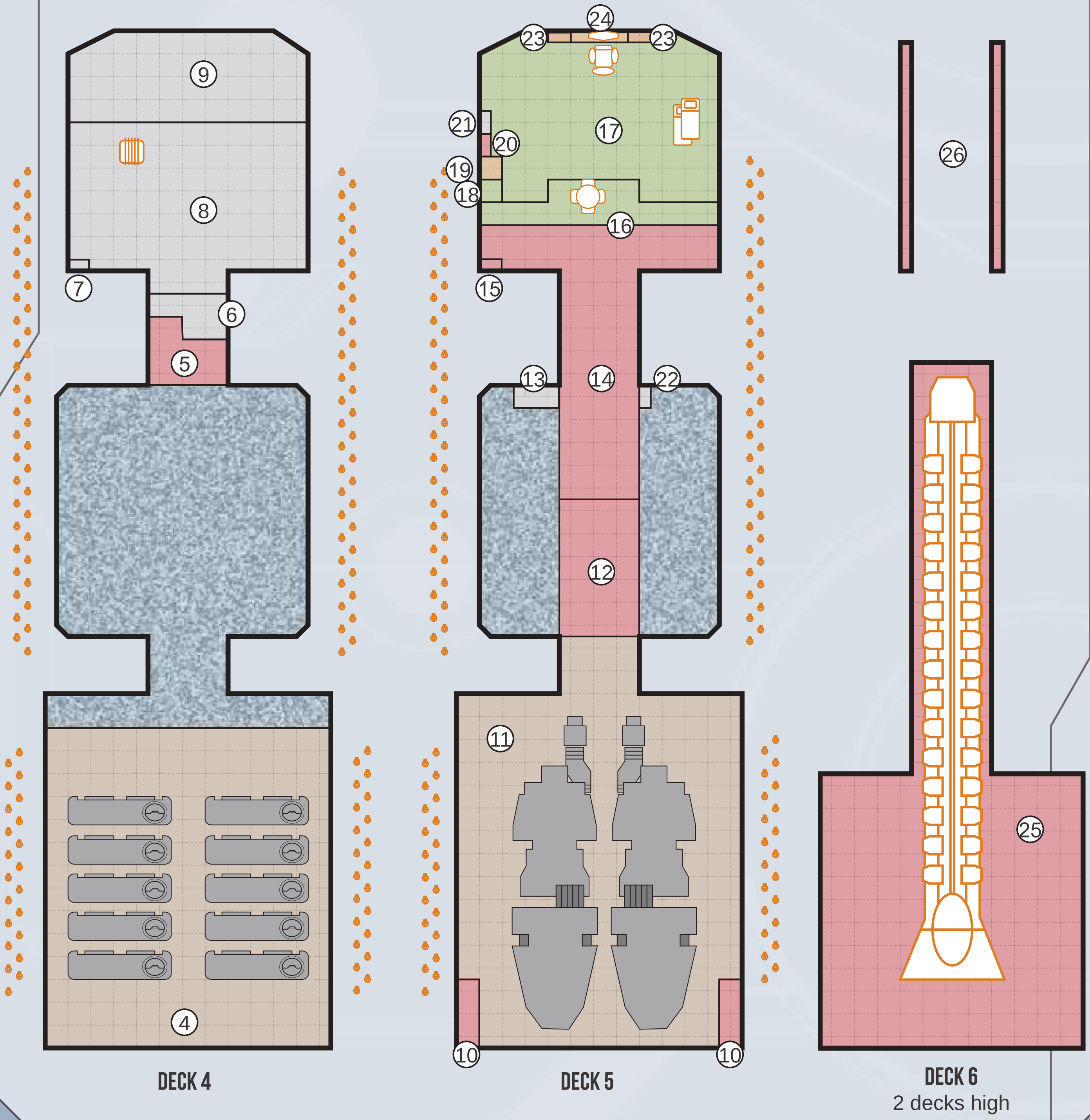
DECK 1
DECK 2
DECK 3

LEGEND

10. Sandcaster canisters storage
11. Manoeuvre drive
12. Missile storage
13. Nuclear dampers
14. Missile bays
15. Airlock
16. Common area
17. Staterooms
18. Medbays
19. Briefing rooms
20. Armoury
21. Workshops
22. Meson screens
23. Sensors
24. Bridge
25. Spinal mount
26. Single turrets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DECK 5
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DECK 6
2 decks high

CLASS: TIGRESS

Although some older battleships of greater displacement remain in service, the *Tigress* dreadnought is the largest line-of-battle vessel currently in service with the Imperial Navy in the Spinward Marches. Each BatRon of *Tigress*-class vessels is virtually a fleet unto itself, as each ship carries 30 squadrons of heavy fighters (with 10 FHs per squadron). A BatRon of eight ships carries 2,400 heavy fighters.

At present, only one *Tigress* BatRon is deployed in the Spinward Marches, assigned to 212th Fleet, at Rhylanor. Additional *Tigress* BatRons are generally assigned one per sector.

Within the sphere, layered decks hold the various on-ship functions such as quarters, computer and electronic equipment, fuel treatment and maintenance areas. Appended to the back of the sphere is a large heavy fighter launch and recovery installation. Fighters are launched to the rear, to starboard, and recovered from the rear, to port; this arrangement prevents them from entering the meson beam when it is in use, as well as providing some armoured bulk between the fighters and the enemy.

Note all the software cannot run at its full rating together. What is running is determined by the needs of the crew at a given time. A full crew is carried but virtual software may be used, if necessary, due to losses.

TL15		Tons	Cost (MCr)
Hull	500,000 tons, Standard	—	25000
	Reinforced	—	12500
	Military	—	6250
Armour	Bonded Superdense, Armour: 17	68,000	34000
	Radiation Shielding	—	12500
M-Drive	Thrust 6 (size reduction x3)	21,000	90000
J-Drive	Jump 4, (fuel efficient x2)	50,005	93759.375
Power Plant	Fusion (TL15), Power 440,000	22,000	44000
Fuel Tanks	J-4, 20 weeks of operation	191,000	—
Bridge	Holographic Controls	140	3125
	Command Bridge	40	30
Computer	Core/100	—	130
Backup	Core/90	—	120
Sensors	Advanced x3	15	15.9
	Distributed Arrays	10	10.6
	Enhanced Signal Processing	2	8
	Military Countermeasures Suite	15	28
Weapons	Meson Spinal Mount (TL15)	66,000	28600
	Small Missile Bays (size reduction x3) x430	15,050	7740
	Medium Repulsor Bays x22	2,200	1320
	Triple Turrets (long range beam lasers) x100	100	287.5
	Triple Turrets (sandcasters) x100	100	175
	Double Turrets (high yield fusion guns) x100	100	490
	Single Turrets (intense focus particle beam) x100	100	520
	Point Defence Laser Batteries (Type III) x50	1,000	1000
Ammunition	Missile Storage (7,680 missiles)	640	—
	Sandcaster Canister Storage (6,000 canisters)	300	—

Crew

Captain, Pilots x3, Small Craft Crew x600, Astrogator, Engineers x922, Maintenance x339, Medics x23, Gunners x509, Administrators x165, Officers x262, Sensops x65

Hull: 366,666

Running Costs

MAINTENANCE COST

MCr29.735911/month

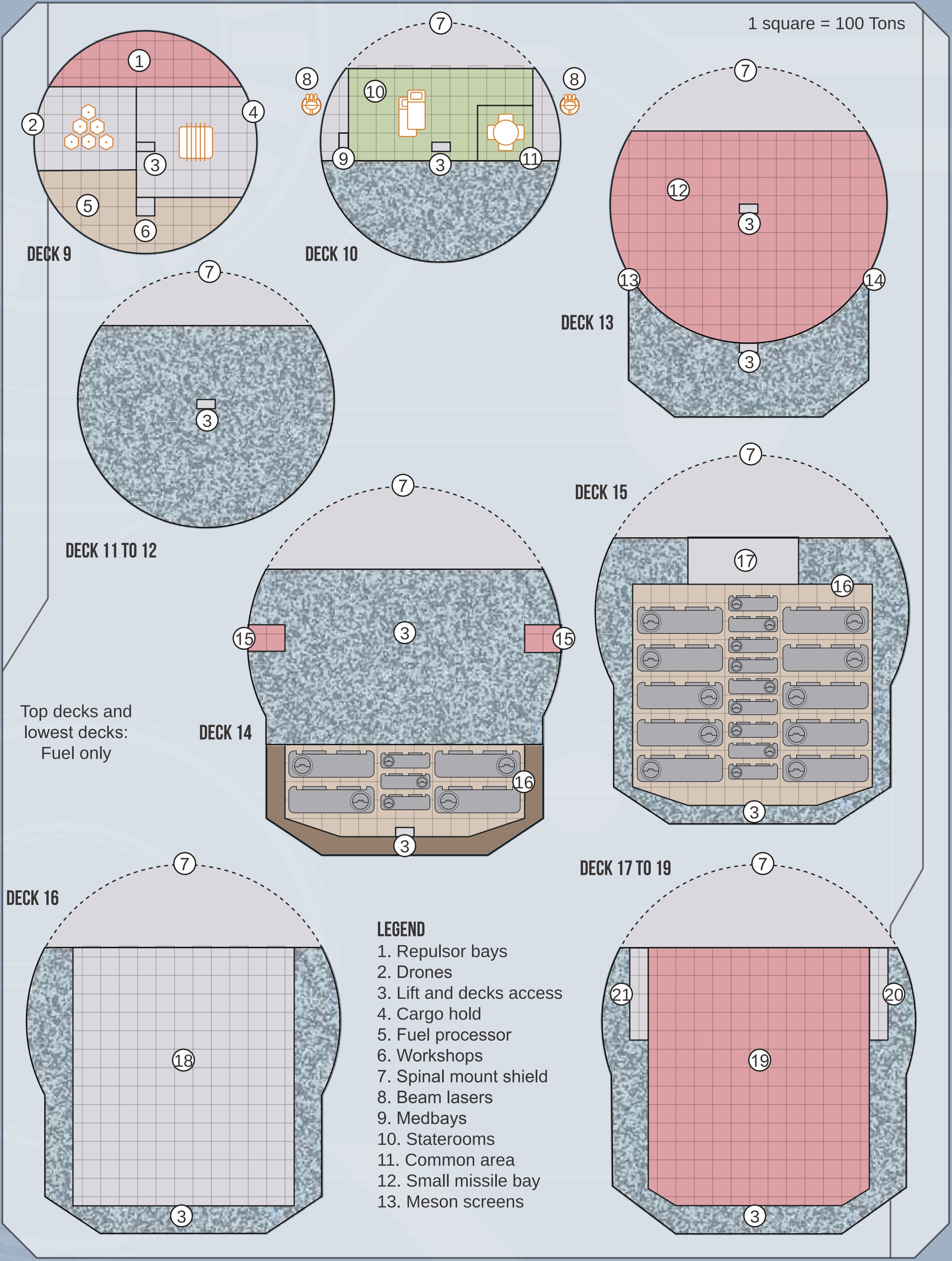
PURCHASE COST

MCr356830.9335

Screens	Meson Screens x7	70	140
	Nuclear Dampers x9	90	90
Armoured Bulkheads	Bridge	14	2.8
	Jump Drive	5,000.5	1000.1
	Manoeuvre Drive	2,100	420
	Power Plant	2,200	440
	Missiles	64	12.8
	Meson Screen	7	1.4
	Nuclear Damper	9	1.8
	Sensors	4.2	0.84
	Small Missile Bays x430	1,505	301
	Meson Spinal Mount (TL15)	6,600	1320
Craft	Docking Spaces (50 tons) x285	15,675	3918.75
	Full Hangars (50 tons) x15	1,500	300
	Heavy Fighters x300	—	22974
Systems	Armoury	117	29.25
	Briefing Rooms x20	80	10
	Fuel Processor (50,000 tons/day)	2,500	125
	Launch Tubes x3	1,500	750
	Medical Bays x25	100	50
	Recovery Decks x3	1,500	750
	Repair Drones	5,000	1000
	Workshops x12	72	10.8
Staterooms	Standard x1,775	7,100	887.5
	High x3	18	2.4
Software	Advanced Fire Control/3	—	18
	Anti-Hijack/3	—	10
	Auto-Repair/2	—	10
	Battle System/3	—	36
	Broad Spectrum EW	—	14
	Electronic Warfare/3	—	24
	Evade/3	—	3
	Jump Control/4	—	—
	Launch Solution/3	—	16
	Library	—	—
	Manoeuvre	—	—
	Intellect	—	—
	Screen Optimiser	—	5
	Virtual Crew/2	—	10
	Virtual Gunner/2	—	10
Common Areas		1,780	178
Cargo		7577.3	—
Total: MCr396478.815			

Power Requirements

Basic Ship Systems	100,000
Manoeuvre Drive	300,000
Jump Drive	200,000
Sensors	34
Weapons	21,650
Screens	390
Fuel Processor	2,500
Medical Bays	25
Launch Tubes	1,500
Recovery Decks	1,500


1 square = 100 Tons
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DECK 11 TO 12
DECK 13
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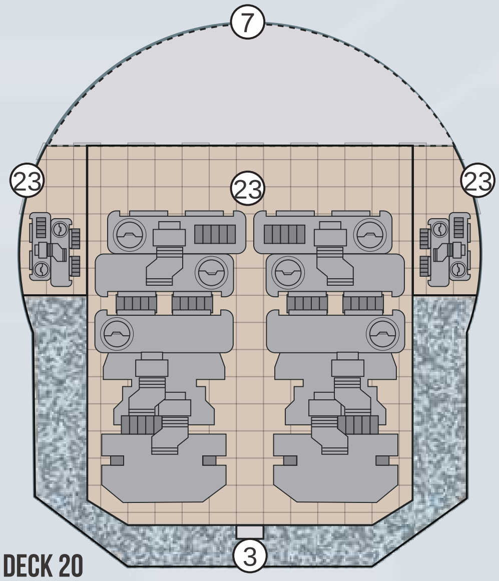
Top decks and
lowest decks:
Fuel only

LEGEND

1. Repulsor bays
2. Drones
3. Lift and decks access
4. Cargo hold
5. Fuel processor
6. Workshops
7. Spinal mount shield
8. Beam lasers
9. Medbays
10. Staterooms
11. Common area
12. Small missile bay
13. Meson screens

1 square = 100 Tons



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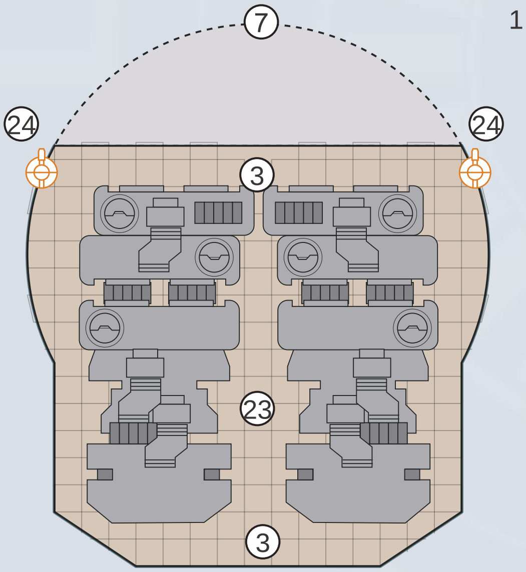

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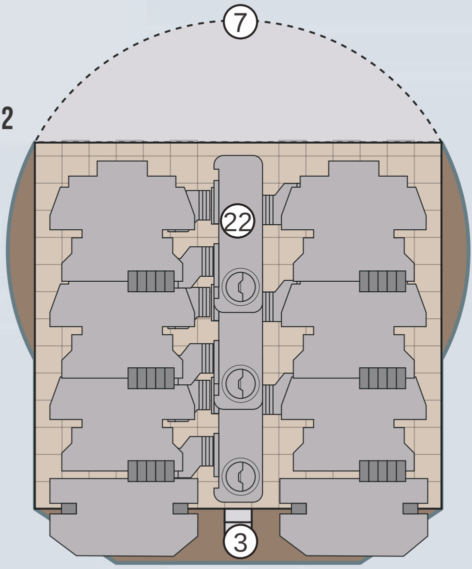

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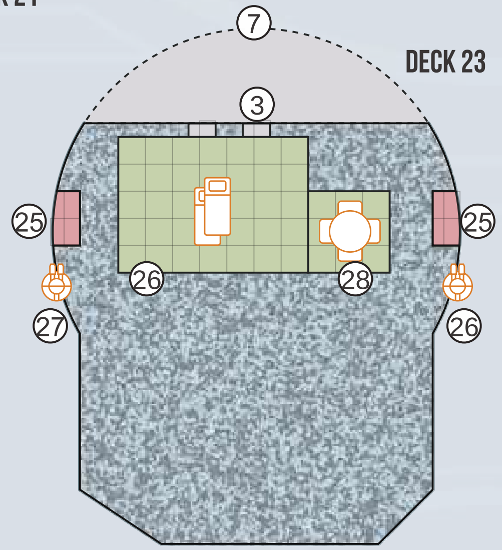
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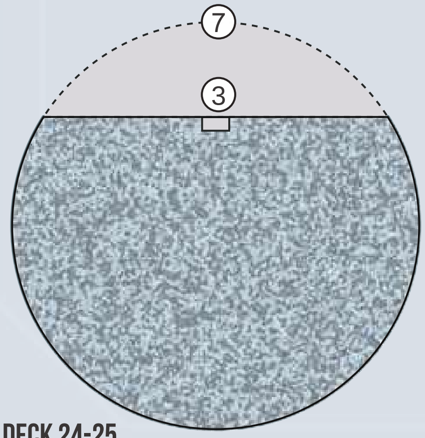
14. Nuclear dampers
15. Point defence batteries
16. Power plant
17. Full hangars
18. Docking space
19. Spinal mount
20. Launch
21. Recovery deck
22. Manoeuvre drive

23. Jump drive
24. Particle beams
25. Point defence batteries
26. Fusion guns
27. Staterooms
28. Common area
29. Cargo hold

30. Command bridge
31. Command bridge
32. Sandcaster barrels storage
33. Bridge
34. Sensors
35. Briefing rooms
36. Drones



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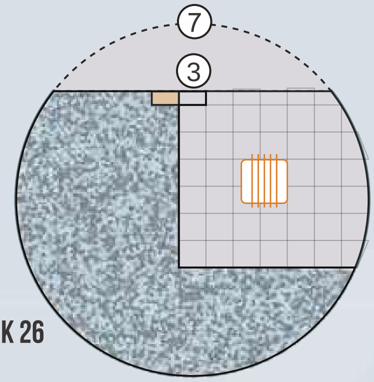

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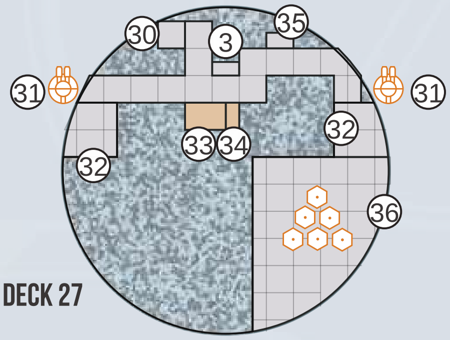
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DECK 27

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TRAVELLER®

HIGH GUARD UPDATE 2022

High Guard Update 2022 is a major expansion to the *Traveller* roleplaying game with rules for designing, building and operating spacecraft found throughout the galaxy. From small and nimble fighter craft to the adventure-class ships that Travellers fly, from gargantuan megafreighters to military capital ships, this book provides everything the aspiring naval architect needs to populate their universe with ships that ply the spacelanes.

This book also provides rules for designing space stations and starports, customising ships, and exotic technologies found in popular science fiction novels and movies that can be incorporated into your universe. There are also advanced rules for sensors, detailed descriptions of starship crew roles, how to conduct violent boarding actions, and detailed guidelines for battles between fighter squadrons and enormous fleet battles.

Finally, High Guard Update 2022 presents dozens of ship designs for the Charted Space universe, including small craft and fighters, traders, gunboats, scout ships and battleships ranging from lethal destroyers to colossal battleships, carriers and dreadnoughts. The revised design system provides a new approach to armour and armaments, making space combat scalable for anything from small skirmishes to devastating clashes between dozens or even hundreds of warships.

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